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The Porphyry Mountains of Jacal.

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HUMBOLDT'S
TRAVELS AND DISCOVERIES
IN
SOUTH AMERICA.

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HUMBOLDT'S

TRAVELS IN AMERICA.

CHAPTER I.

Birth and education of Humboldt—Early love of travel, and projected expeditions—Receives permission to travel in South America—Arrival at Cumana—Extraordinary phenomenon on the Plain of Cumana—Bathing—Description of the city.

[1769—1799.]

FREDERICK HENRY ALEXANDER VON HUMBOLDT, commonly called the Baron de Humboldt, was born at Berlin, on the 14th of September, 1769; a year remarkable for the birth of many men who became in after-times exceedingly celebrated. He received his academical education at Göttingen and Frankfort on the Oder; and before he attained the age of twenty-one he began to avail himself of the advantages which a competent fortune afforded him in the gratification of a liberal curiosity and an ardent love of the physical sciences. In 1790, he visited Holland and England; and in the same year published his first work, entitled, "Observations on the Basalts of the Rhine." In the following year he went to Friburg to receive the instructions of the geologist Werner; in 1792, he was appointed assessor of the Council of Mines at Berlin, and subsequently director-general of the mines of the principalities of Baireuth and Anspach in Franconia. He afterwards visited part of Italy and Swit-

zerland, and in 1795 repaired to Vienna, where he remained some time engaged in the study of a fine collection of exotic plants. After some further excursions in other parts of Europe, he went to Paris, where he contracted an intimacy with M. Aimé Bonpland, then a pupil of the School of Medicine and the Garden of Plants, who was afterwards his companion in the travels, which form the immediate subject of our narrative.

Of the feelings which animated him at this period he has himself left us an account. "From my earliest youth," he says, "I had experienced an ardent desire to travel into distant regions, little visited by Europeans. This desire characterizes a period of our existence when life appears to us an unbounded horizon, and when nothing has greater attraction for us than strong agitations of the mind, and the image of physical dangers. Educated in a country which has no direct communication with the colonies of the two Indies, then living amidst mountains remote from the coast, and celebrated for their numerous mines, I felt an increasing passion for the sea, and for long expeditions. The objects with which we are acquainted only through the animated narratives of travellers, have a particular charm for us; our imagination is pleased with everything vague and undefined; and the pleasures of which we are deprived, seem preferable to those which we experience daily in the narrow circle of sedentary life: a taste for herborization, the study of geology, a rapid excursion in Holland, England, and France, with the celebrated George Forster, who had the happiness to accompany Captain Cook in his second expedition round the globe, contributed to give a determined direction to the plan of travels which I had

formed at eighteen years of age. It was no longer the desire of agitation and of a wandering life; it was the desire of contemplating a wild and majestic nature varied in its productions; it was the hope of collecting some facts useful to the advancement of science, which incessantly impelled my wishes towards the fine regions situated beneath the torrid zone. As my personal situation did not permit me then to execute the projects by which my mind was so vividly occupied, I had leisure to prepare myself during six years for the observations which I purposed to make on the New Continent, to visit different parts of Europe, and study the lofty chain of the Alps, the structure of which I have been afterwards able to compare with that of the Andes of Quito and Peru. As I employed in succession instruments differently constructed, I fixed my choice on those which appeared to me the most exact, and the least subject to break in the carriage. I had an opportunity of repeating measurements which had been taken according to the most rigorous methods; and I learnt from experience the extent of the errors to which I might be exposed."

Being at Paris in the year 1798, when an expedition of discovery to the southern hemisphere, under the direction of Captain Baudin, was planned, Humboldt made preparations for joining it, in company with his friend Bonpland, who was appointed one of the naturalists. But the war which broke out with Austria compelled the revolutionary government of France to divert to less peaceful purposes the funds which had been set apart for this expedition; and the enterprise was abandoned.

His next design was to visit the northern countries of Africa, to examine, among other things, the Atlas

chain of mountains, and then join the French savans in Egypt; but in this, too, he was disappointed. The wars which unhappily then prevailed rendered it unsafe for any French vessel to attempt to cross the Mediterranean; and a Swedish frigate, in which he might have obtained a passage to Algiers, was injured in a storm, and prevented from reaching Marseilles, where he awaited her. His patience being exhausted, he repaired to Spain, intending to pass the winter there, and hoping to find in the spring a conveyance to the coast of Barbary. But from this African expedition he was diverted by an intimation which he received while in Spain, to the effect that he might obtain permission to visit the American possessions of that power.

In March, 1799, Humboldt was presented to the Spanish king, to whom he explained the motives which led him to undertake a voyage to the New Continent. Supported by the minister, Don Mariano Luis de Urquijo, he received permission to visit the territories then possessed by Spain, in the interior of South America. "Never," to use his own expressions, "had a more extensive permission been granted to any traveller; never had foreigner been honoured with more confidence on the part of the Spanish government. To dissipate all the doubts which the viceroys, or the captains-general, representing the royal authority in America, might raise upon the nature of my labours, the passport of the first secretary of state declared that I was authorised to use freely my instruments for physical and geodesical operations, that in all the Spanish possessions I might make astronomical observations, measure the height of mountains, gather the productions of the soil, and execute all the operations which I should judge useful for the advancement of science."



The Flamingo.

Impatient to avail himself of this permission, Humboldt prepared with eagerness for his departure; he had experienced so many difficulties in the year past, that he had some difficulty, he says, in persuading himself that his most ardent wishes would be at length fulfilled. He left Madrid, in company with Bonpland, towards the middle of May, and sailed from Corunna in a Spanish ship of war on the 5th of June. Touching at Teneriffe, the travellers remained there a few days, in the course of which they ascended to the summit of the Peak, and made many interesting and valuable observations. Directing their course across the Atlantic towards South America, they arrived in the port of Cumana on the 16th of July, forty-one days after their departure from Corunna.

The ship anchored at day-break opposite the mouth of the River Manzanares; but the necessity of awaiting the visit of the officers of the port prevented our travellers from landing till very late in the morning. "Our looks," says Humboldt, "were fixed upon groups of cocoa-trees, which bordered the river, and the trunks of which, exceeding sixty feet in height, towered over the landscape. The plain was covered with tufts of cassias, capparais, and those arborescent mimosas, which, like the pine of Italy, extend their branches in the form of a parasol. The pinnated leaves of the palms stood out in bold relief against the azure of a sky, the purity of which was not sullied by any trace of vapour. The sun was mounting rapidly toward the zenith. A dazzling light was spread through the air, over the white hills strewed with cylindrical cactuses, and over that ever calm sea, the shores of which are peopled with alcatras, egrets, and flamingoes. The brightness of the day, the vivid colours of the vegetation, the form of the

plants, the varied plumage of the birds, all announced the grand character of nature in the equinoctial regions."

On landing, they were conducted to the governor, who expressed great satisfaction on learning that they intended to remain some time in the province of New Andalusia. He took great interest in everything relating to natural philosophy, and talked to them of azote, oxide of iron, and the hygrometer,—words as agreeable to their ears "as the name of his native country pronounced on a distant shore to those of a traveller." Towards the evening they disembarked their instruments, and had the pleasure of finding that none had been damaged. They hired a spacious house, the situation of which was favourable for astronomical observations; when the breeze blew they enjoyed an agreeable coolness, the windows being without glass, and even destitute of its frequent substitute at Cumana,—paper.

The city of Cumana, properly so called, stands at the distance of a mile from the shore; it is commanded by the castle of St. Antonio, and occupies the ground between that fort and the little rivers Manzanarez and Santa Catalina. It has three suburbs, the largest of which is the Indian suburb of the Guayquerias. The arid plain of Cumana exhibits, after violent showers, an extraordinary phenomenon. "The earth, drenched with rain, and heated again by the rays of the sun, emits that musky odour, which under the torrid zone, is common to animals of very different classes;—to the jaguar, the small species of tiger-cat, the thick-nosed tapir, the gahlinazo vulture, the crocodile, vipers, and rattlesnakes. The gaseous emanations which are the vehicles of this aroma, seem to be evolved in proportion only as the mould containing the spoils of an

innumerable quantity of reptiles, worms, and insects, begins to be impregnated with water. I have seen Indian children, of the tribe of the Chaymas, draw out from the earth and eat, millepedes or scolopendras, eighteen inches long and upwards of half an inch broad. Wherever the soil is turned up, one is struck with the mass of organic substances which by turns are developed, transformed, or decomposed. Nature, in these climates, appears more active, more fruitful, we might even say more prodigal, of life."

The waters of the Manzanares are very clear, and its banks extremely pleasant, being shaded by mimosas, erythrinas, ceibas, and other trees of gigantic growth. The temperature of the river is often twenty degrees below that of the air; and thus it becomes an inestimable benefit in a country where the heats are excessive during the whole year, and where it is so agreeable to bathe several times in the day. The children pass, as it were, a part of their lives in the water; all the inhabitants, even the ladies of the richest families, learn to swim; and one of the first questions asked on meeting in the morning, is, whether the water is cooler than on the preceding evening. The mode of enjoying the bath is sufficiently varied. "We frequented every evening," says Humboldt, "a society of very estimable persons in the suburb of the Guayquerias. Under a fine moonlight, chairs were placed in the water; the men and the women were lightly clothed, as in some baths of the north of Europe; and the family, and the strangers assembled on the river, passed several hours in smoking cigars, and talking, according to the custom of the country, about the extreme dryness of the season, the abundant rains in the neighbouring districts, and particularly of the luxury of which the ladies of Cu-

mana accuse those of Caracas and the Havannah. The company were under no apprehension from the *bavas*, or small crocodiles, which are now extremely scarce, and which approach men without attacking them. These animals are three or four feet long. We never met with them in the Manzanares, but with a great number of dolphins, which sometimes ascend the river in the night, and frighten the bathers by spouting water."

The port of Cumana is described as a road capable of receiving all the navies of Europe; and the whole of the Gulf of Cariaco affords excellent anchorage. The sea is calm, the hurricanes of the West Indies being never felt here. Earthquakes, however, are frequent, and have sometimes produced very fatal effects. In 1766, the city was entirely destroyed; and in 1797, four-fifths of it were again overwhelmed.

The picture which Humboldt has drawn of the general appearance of Cumana is very interesting. "The city, placed at the foot of a hill destitute of verdure, is commanded by a castle. No steeple, or dome, attracts from afar the eye of the traveller, but only a few trunks of tamarind, cocoa, and date trees, which rise above the houses, the roofs of which are flat. The surrounding plains, especially those on the coasts, wear a melancholy, dusty, and arid appearance, while a fresh and luxuriant vegetation points out from afar the windings of the river which separates the city from the suburbs, the population of European and mixed race from the natives with a coppery tint. The hill of Fort St. Antonio, isolated, naked, and white, reflects a great mass of light and of radiating heat. In the distance, toward the south, a vast and gloomy curtain of mountains stretches along. Majestic forests cover this cordillera of the interior, and are joined by a woody vale to the

open clayey lands and salt marshes of the environs of Cumana. A few birds, of considerable size, contribute to give a particular physiognomy to these countries. On the sea-shore, and in the gulf, we find flocks of fishing-herons and alcatras of a very unwieldy form, which swim like the swan, raising their wings. Nearer the habitations of men, thousands of galenas, vultures, the true jackals of the winged tribe, are ever busy in uncovering the carcasses of animals. The coasts are bathed by a tranquil sea of an azure tint, and always gently agitated by the same wind. A pure and bright sky, offering only a few light clouds at sunset, rests on the ocean, on the peninsula [of Araya] destitute of trees, and on the plains of Cumana; whilst storms are seen to form, accumulate, and resolve into fertile showers among the mountain-tops of the interior. It is thus that on these coasts, as at the foot of the Andes, the earth and the skies offer the extremes of clear weather and fogs, of drought and torrents of rain, of absolute bareness and a verdure incessantly renewed. In the New Continent, the low regions on the sea-coasts differ as widely from the inland mountainous districts, as the plains of Lower Egypt from the high lands of Abyssinia."

CHAPTER II.

Excursions from Cumana—The Alps of America—Cabins of the Mestizoes—Ridge named *The Impossible*—South American forests—Bamboo plants—Village of San Fernando—The Superior of the Mission—Town of Cumanacoa—Ravages of wild beasts—Caverns with luminous exhalations.

[1799.]

FOUR months elapsed after the arrival of our travellers at Cumana, before they finally quitted it on their great expedition to the Orinoco. But in this interval they made two excursions,—one, to the peninsula of Araya and its salt-works, the other to the missions of the Chayma Indians, in the mountains of New Andalusia. This second excursion was commenced on the 4th of September, the travellers quitting the city of Cumana at an early hour.

“After a journey of two hours,” says Humboldt, “we reached the foot of the lofty chain of the interior mountains, which runs from east to west, from the Brigantine to the Cerro de San Lorenzo. Here, new species of rock commence, and, with them, a new aspect of vegetation. Everything here assumes a more majestic and picturesque character. The ground, watered by springs, is intersected in all directions. Trees, of a gigantic height, and covered with creepers, shoot up in the ravines; their bark, blackened and burned by the twofold action of light and atmospheric oxygen, forms a contrast with the vivid green of the pothos and dracontium, the leather-like and glossy leaves of which frequently shoot out to the length of several feet. The parasitical monocotyledons, between the tropics, may be said to occupy the place of the mosses and the



lichens of our northern zone. As we proceeded, the mountains, both by their shape and grouping, brought to our recollection the scenery of Swisserland and the Tyrol. Upon these Alps of America, even at considerable heights, we met with the *Heliconia*, the *Costus*, the *Maranta*, and others of the cane family; while, near the coast, the same plants delight only in low and swampy situations. It is thus, that, by an extraordinary similarity, in the torrid zone, as in the north of Europe, under the influence of an atmosphere continually loaded with fog, as upon a soil moistened by melting snow, the vegetation of mountains presents all the characteristic features of that of marshy places."

The cabins of the Mestizoes dwelling in these parts were found placed in the midst of small enclosures, containing bananas, papayas, sugar-canes, and maize. Humboldt remarks, that the small extent of their cleared spots would surprise us, if we did not recollect that an acre, planted with banana-trees, yields nearly twenty times the quantity of aliment which the same space would give if sown with grain. This superior fecundity of nature in the torrid zone, prevents the spreading of a population over a wide space. In Europe, the wheat and other kinds of grain, necessary for the food of its inhabitants, cover a vast extent of country; and the cultivators necessarily come into contact with each other. In the torrid zone, the reverse is the case; there the fertility of the soil corresponds with the heat and humidity of the atmosphere, and man avails himself of those vegetables which rise most rapidly, and yield most abundantly. Thus, a numerous population finds ample subsistence within a narrow space, and the tracts of cultivated land are separated from each other by the intervention of large wastes. Even in the

neighbourhood of the most populous cities of equinoctial America, the surface of the earth is bristled with forests, or covered with a thick sward which the ploughshare has never divided; plants of spontaneous growth predominate by their luxuriance and their masses over those that are cultivated, and determine the character and aspect of the country. To an European traveller, unmindful of this distinction, or not knowing how small an extent of soil will suffice in those regions for the maintenance of a family, a populous province might seem almost uninhabited.

Continuing their ascent, our travellers arrived about dusk on the summit of a ridge, to which had been given the name of *The Impossible*, under the belief that it would afford the inhabitants of Cumana a safe retreat from an enemy landing on the coast. In the year 1797, when that port was threatened, after the capture of Trinidad by the English, many of the people fled to Cumanacoa, leaving their most valuable effects in sheds built upon this ridge. Yet by the route of *The Impossible* the cultivators of the plains of the interior transport their cattle, skins, and provisions to Cumana.

The travellers spent their night in a house at which was stationed a military post of a Spanish sergeant and eight men. Without, the scene around them was remarkably impressive; in several parts the neighbouring forests were on fire, and the flames arising from the burning masses, amidst clouds of smoke, produced a very striking spectacle. These conflagrations are sometimes occasioned by the negligence of the wandering Indians; and they are sometimes the result of design, the woods being burnt for the sake of improving the pasturage. In the western part of North America a vast extent of prairie ground is

annually overrun by fire, the result more frequently of design than of accident; and Mungo Park mentions a practice prevailing in the central countries of Africa, of setting on fire the dry grass, and thereby rendering the country more healthful and pleasant.

On the morning of the 5th, before sunrise, the travellers quitted The Impossible, and descending by a narrow path, entered at the foot of the mountain a thick forest intersected by numerous rivers.

“When a traveller, just arrived from Europe, penetrates, for the first time, into the forests of South America, nature presents herself under an aspect quite unlooked-for. The surrounding objects recall but a faint remembrance of the pictures traced by writers of celebrity on the banks of the Mississippi, in Florida, and in the other temperate regions of the New World. He is sensible, at every step, that he is not on the borders, but in the centre of the torrid zone; not on one of the islands of the Antilles, but on a vast continent, where every thing is gigantic,—mountains, rivers, and the whole mass of the vegetable creation. If he takes delight in the beauties of rural scenery, he finds himself at a loss to define the nature of his mingled feelings. He is unable to distinguish that which most excites his wonder,—whether the deep stillness of the wilderness, the individual beauty and contrast of the objects, or that freshness and grandeur of vegetable life, which characterize tropical climates. The plants with which the earth is overburdened may be said to want room for their developement. The trunks of trees are everywhere concealed under a thick carpet of verdure; and if one could carefully transplant the families of the Orchis, the Piper, and the Pothos, which draw their nourishment from a sin-

gle Courbaru, or fig-tree of America, (*Ficus gigantea*,) one might be able to cover with them a very extensive spot of ground. By this singular grouping, forests and the sides of rocks and mountains enlarge the dominion of organic nature. The same creeping plants which run along the ground climb to the tops of trees, and pass from one to another at the height of more than a hundred feet. It is thus that the continual intertwining of parasitical plants often leads the botanist to confound the flowers, fruits, and foliage belonging to different species."

Issuing from the woods, they entered an open country, covered with aquatic plants of a height varying between eight and ten feet. As far as the village of San Fernando, which was distant from the forest about a league, the road was bordered by a species of bamboo, growing upwards of forty feet high. The elegance of this plant is spoken of in high terms, the form and disposition of its leaves imparting to it a character of lightness which contrasts agreeably with its great height; and Humboldt thinks, that of all the vegetable forms of the tropical regions, those of the bamboo and fern-tree most forcibly strike the imagination of the traveller. He observes that the bamboo plants are less common in America than is usually supposed, although they form dense woods in New Grenada and Quito, and are found in abundance on the western slope of the Andes. "One might say," he adds, "that the western slope of the Andes was their true country; yet what is sufficiently remarkable, we have found them not only in the low regions on a level with the ocean, but also in the high valleys of the Cordilleras, even at an elevation of 860 toises."

Entering the village of San Fernando, which is

situated in a narrow plain bounded by limestone rocks, the travellers were agreeably impressed by the regularity of the place, the uniformity of the buildings, the extreme neatness of the dwellings, and the sober and silent air of the inhabitants. The appearance of this missionary station—the first which they had seen in America—recalled to their recollection the establishments of the Moravian brethren. The streets were straight, intersecting each other at right angles; the houses of the Indians were built of clay, strengthened by lianas. Besides the private gardens, there was a common garden, towards the cultivation of which every Indian family contributed a portion of its labour, the adults of both sexes working therein one hour in the morning, and one in the evening. In the centre of the village was the great square, containing the church, the missionary's house, and an humble edifice bearing the pompous appellation of *Casa del Rey* or House of the King—an establishment common in the Spanish settlements, and intended for the accommodation of travellers, to whom it must needs be of great service in a country destitute of inns. The number of families at the mission amounted to about one hundred. The Superior, who received the travellers with kindness, is thus described:

“The missionary of San Fernando was a Capuchin, a native of Arragon, very far advanced in years, but still vigorous and cheerful. His great corpulency, his sprightly disposition, and the interest which he took in battles and sieges, but ill accorded with the notion formed, in northern countries, of the melancholic abstraction and contemplative life of a missionary. Though closely busied with a cow which was to be slaughtered the next morning, the old monk yet re-

ceived us with good humour; and gave us leave to sling our hammocks in a gallery of his house. Seated, without employment, during the chief part of the day, in a great arm-chair of red wood, he complained bitterly of what he termed the idleness and ignorance of his countrymen. He asked us a thousand questions concerning the real motive of our travels, which to him seemed hazardous, and, at best, useless. Here, as on the Orinoco, we were harassed by that eager curiosity which, in the midst of the forests of America, Europeans retain respecting the wars and political storms of the Old World.

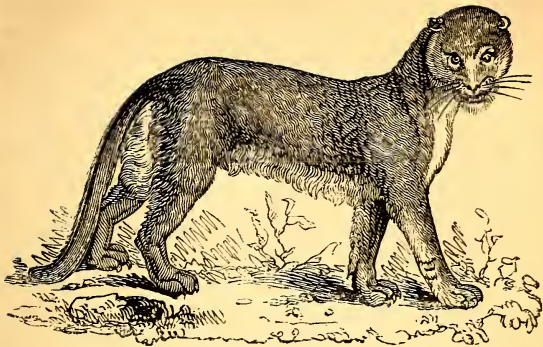
"In other respects, our missionary appeared to be satisfied with his situation. He treated the Indians mildly; he saw his mission prosper; and he extolled with enthusiasm the water, the bananas, and the milk diet of the district. He smiled contemptuously at the sight of our instruments, books, and dried plants; and acknowledged, with a frankness peculiar to these climates, that of all the enjoyments of life, not excepting sleep, none was to be compared with the pleasure of eating good beef, *carne de vacca* (cow's flesh); so true is it, that sensuality springs from the absence of mental occupation. Our host persuaded us repeatedly to visit the cow which he had just purchased; and the next day, at sunrise, he insisted on our going to see the animal killed according to the custom of the country, namely by cutting the ham-string, and then plunging a large knife between the vertebræ of the neck. Disgusting as the operation was, we learnt from it the expertness of the Chaymas Indians, who, eight in number, cut the beast into small joints in less than twenty minutes. The cow had cost but seven piastres, yet this seemed to be considered a very high price. The

same day the missionary paid eighteen piastres to a soldier of Cumana, for bleeding him in the foot. This fact, of little apparent importance, strikingly proves how much, in wild uncultivated countries, the value of commodities differ from that of labour."

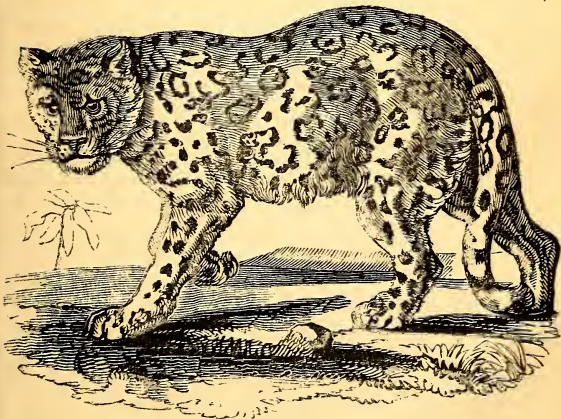
From San Fernando they proceeded to the village of Arenas, and from thence to Cumanacoa, a small town, of low slight houses, chiefly built of wood. Their attention was here principally attracted by the climate, which was found to differ in an extraordinary degree from that of the neighbouring town of Cumana. The distance of Cumanacoa from that port is about seven leagues, or four-and-twenty miles; and the little plain on which it stands and which is surrounded by lofty mountains, is elevated only about 100 toises, or 665 feet, above the level of the sea. Yet there is a considerable difference in temperature between the two places; and what is more remarkable, although it seldom or never rains at Cumana, there is a regular rainy season of seven months' duration at Cumanacoa. It was during this season that the travellers visited Cumanacoa. Every night, from eight or nine o'clock, they found the sky obscured by a thick fog; about two o'clock in the afternoon there was always a gathering of large black clouds, from which issued peals of thunder and torrents of rain; at five a change took place, and the sun again appeared. This abundance of moisture being very favourable to the vegetation, the soil is remarkably fertile. The plain of Cumanacoa is celebrated for its tobacco, which is inferior in aroma only to that of Cuba and the Rio Negro; it is almost the only part of the province of Cumana in which the plant is cultivated. The inhabitants of the plain were rather incommoded by the jaguars which issued from

caves in the neighbouring mountains, and roamed about the plantations at night. The year before, one of those animals had nearly devoured a horse belonging to a farmer; the groans of the victim awakened the slaves, who went out armed with knives and lances, and despatched the intruder after a vigorous resistance.

While at Cumanacoa, the attention of our travellers was attracted to a ravine in the neighbouring mountains, containing two caverns, out of which there issued occasionally jets of flame powerful enough to light up the adjacent heights, and be visible at a great distance in the night. The phenomenon had become more frequent of late; and the inhabitants knowing that similar luminous exhalations had preceded the destruction of four-fifths of the city of Cumana in 1797, were disposed to fear similar calamitous consequences in their own neighbourhood. Humboldt's first attempt to penetrate into the ravine was frustrated by the luxuriance of the vegetation: but by the assistance of the natives, who were rather anxious to have the German miner's opinion of a fancied gold mine which lay in the desired route, a path was cleared through the thorny and intertwining plants which obstructed the woods. After ascertaining that the supposed gold ore was but iron pyrites in a bed of black marl, the travellers pursued their way until they reached a lofty wall of rock rising perpendicularly to the height of nearly a mile. Here they saw two inaccessible caverns inhabited apparently by nocturnal birds; it was from these caverns that the flames had been observed to issue. Humboldt was unable to ascertain the cause of these luminous exhalations.



The Puma



The Jaguar.

CHAPTER III.

The Plateau of Cocollar—View therefrom—Missions of San Antonio and Guanaguana—Perilous passage into the Valley of Caripe—The Convent of Caripe—The Cave of Guacharo, and its nocturnal birds—Forest of Santa Maria—Magnificent vegetation—The mission of Catuaro—Condition of the Negroes—The town of Cariaco—Its unhealthiness—Return to Cumana—General remarks on the Indians of New Andalusia—Effect of the Missions—The Aborigines of America.

[1799.]

PROCEEDING from the plain of Cumanacoa toward the missions of San Antonio and Guanaguana, the travellers passed three days on the plateau of Cocollar, at the farm of a Spaniard, who was the sole survivor of an expedition which had been sent into the New World to form establishments for supplying the Spanish navy with timber. The climate was delightful, and the scenery possessed a character of novelty and magnificence. From the elevated point which they occupied, the eye, as far as it could reach, saw only naked savannahs, although in the neighbouring valleys there were scattered trees, and beautiful flowers.

“Nothing,” says Humboldt, “can be compared with the sense of that majestic stillness produced by the appearance of the sky in this solitary spot. At night-fall, while our eye was ranging over those meadows which bound the horizon, over that gently undulated table-land covered with grass and herbs, we fancied we saw at a distance, as in the Steppes of the Oronoco, the surface of the ocean supporting the starry canopy of heaven. The tree under which we sat, the luminous insects fluttering in the air, the constellations glittering in the south, every thing seemed to say that we were far from our native land. If in the midst of this exotic nature, our ear caught, from the bottom of a valley, the

tinkling of a cow-bell, or the roaring of a bull, the remembrance of our own country was forthwith awakened. It was like the echo of distant sounds from beyond the seas, transporting us by its magic power from one hemisphere to the other. Strange wandering of the human imagination! Endless source of enjoyment and of pain!"

On the 14th of September, they entered the beautiful valley in which are situated the two missions of San Antonio and Guanaguana; and resting but a short time at the former, they reached the latter in the evening, and were received with great civility by the old missionary. The village had not been established at this place more than thirty years, having been transferred from a more southerly spot which it previously occupied. The Indians remove their dwellings with remarkable facility; there are in South America several small towns which have changed their situation three times in less than half a century. The *padre*, who had been an inhabitant of the forests of America for a long period, told the travellers, that according to the invariable practice of the missions, the funds of the community or the produce of the labour of the Indians, must first be employed in the construction of a house for the missionary, then in building a church, and lastly in clothing the Indians; and from this order he assured them that no departure could on any pretext be allowed. Under these circumstances, it is perhaps fortunate that the Indians, whose turn comes last, prefer positive nakedness to the lightest clothing. No church had yet been erected at Guanaguana; only the first step in the scale of civilization had been surmounted, a spacious dwelling for the missionary having been just completed. "We remarked, with some surprise," says

Humboldt, "that this house, the top of which terminated in a terrace, was ornamented with a great number of chimneys resembling so many turrets; this, our host said, was to recall to his recollection a country which was dear to him, and to remind him of the winters of Arragon in the midst of the heats of the torrid zone."

From the valley of Guanaguana, our travellers proceeded into that of Caribe. Their route lay along a sort of dike, or limestone ridge, which separates the one from the other, and which is known by the name of the *Cuchillo de Guanaguana*, literally, the Knife of Guanaguana. The journey was one of some difficulty; the slopes were covered with very slippery turf; and oftentimes the path was only fourteen or fifteen inches broad, with a precipice seven or eight hundred feet in depth, on either side. Yet the sure-footed mules carried them safely through it. Humboldt observes that nothing is more common than to hear the mountaineers say, "I shall not give you the easiest-going mule, but *la mas racional*—the most reasoning one;" and he adds that "this popular expression, dictated by long experience, combats the system of animal machines better perhaps than all the arguments of speculative philosophy." The valley of Caribe is elevated nearly a quarter of mile above that of Guanaguana; the contrast between the climate of the two is remarkable, the former being cool and salubrious, while the latter is extremely hot.

When our travellers reached the convent of Caribe, the Superior was absent; but having heard of their intended visit, he had made arrangements for rendering their stay agreeable. The society happened to be numerous; consisting of several young monks who had

recently arrived from Spain, and were about to be distributed among the different missions, and some old and infirm missionaries who were seeking health in the salubrious mountain air. Humboldt speaks in high terms of their conduct towards him, as indeed of that of the Spanish missionaries generally. "During our abode in the convents and missions of America," he says, "we never experienced the slightest mark of intolerance. The monks of Caribe were not ignorant that I was born in the Protestant part of Germany. Furnished with the orders of the court, I had no motive to conceal from them this fact; yet at no time did any sign of distrust, any indiscreet question, any attempt at controversy, lessen the value of a hospitality bestowed with so much good breeding and frankness."

The principal object which attracted the attention of our travellers during their stay at Caribe, was the great *Cueva de Guacharo*, or Cave of Guacharo, situated in a valley about three leagues from the convent. Humboldt observes, that in a country where the people love the marvellous, a cavern which gives birth to a river, and is inhabited by many thousand of nocturnal birds, the fat of which is employed in the missions for dressing food, is an inexhaustible subject of conversation and discussion. Our travellers, accompanied by most of the monks of Caribe and some Indians, visited the *Cueva de Guacharo*, on the 18th of September; they found their way to it by ascending the small river which issues from the cave, sometimes wading through the water, at others walking in a strip of muddy soil between the torrent and a wall of rock. The mouth of the cavern was of vast dimensions, being about eighty-five feet in width, and nearly eighty in height; it was formed in the face of a rock, which was covered with

gigantic trees, intermingled with numberless beautiful plants, some of which hung in festoons over the entrance. This luxuriant vegetation, which extended even a short distance within the recess, gave to it a character, which, in a less favoured clime, it would not have possessed; as Humboldt remarks, it is with the openings of caverns as with cascades, their principal attraction is derived from the local scenery.

The bird of night, from which this cavern obtains its name of Guacharo, is of the size of the domestic fowl, and has, in some degree, the appearance of a vulture; the colour of its plumage is a dark bluish-gray, spotted with black, and its wings, when expanded, measure three feet and a half. It lives on fruits, and quits the cave in the evening only. When the travellers had penetrated about 460 feet into the cavern, the distant screams of these birds became audible; and at the same time it was found necessary to light the torches.

"It is difficult," says Humboldt, "to form an idea of the frightful noise made by thousands of these birds in the dark part of the cavern: it can be compared only to that of our crows, which, in the fir-forests of the north, live in society, and build their nests in trees which meet at the top. The shrill and piercing tones of the guacharo reverberate from the arched roof, and echo repeats them in the depths of the cavern. The Indians, by fixing torches to the end of a long pole, pointed out to us the nests of these birds; they were fifty or sixty feet above our heads, in funnel-shaped holes, with which the whole roof of the grotto is riddled. The noise increased with our advance, and with the alarm of the birds at the flare of our copal torches. When it ceased for a few minutes around us, we heard distant moans from other branches of

the cavern. The different flocks might be said to give alternate responses.

“The Indians go once a year into the Cueva del Guacharo, about Midsummer, furnished with poles, with which they destroy the greater part of the nests. At this time many thousand birds are killed, and the old ones, as if to protect their broods, hover over the heads of the Indians, uttering the most dreadful shrieks. The young that fall to the ground are ripped open immediately. The peritoneum is thickly loaded with an unctuous substance, and a layer of fat runs from the abdomen to the anus, forming a kind of cushion between the birds’ thighs. This abundance of fat in frugivorous animals not exposed to the light, and having few muscular motions, reminds us of the inclination to obesity long observed in geese and oxen. We know how very much darkness and repose favour this process. European birds of night are meagre, because, instead of feeding on fruit, like the guachara, they live on the scanty produce of the chase. At the period commonly termed the oil-harvest, the Indians construct little habitations of palm-leaves close to the opening, and even in the mouth of the cavern. We saw some remains of such still standing. Here, over a fire of dry sticks, the grease of the young birds just killed is melted, and run into pots of white clay. This grease, known by the name of guacharo butter, or oil, is semi-liquid, transparent, and inodorous; and so pure, that it may be kept more than a twelvemonth without becoming rancid. At the convent of Caripe, no oil but that of the cavern was used in the monks’ kitchen, and we never found it give to the dish either a disagreeable taste or smell.”

The Indians have a superstitious dread of penetrating

far into this cavern, believing that the souls of their ancestors inhabit its deep recesses; on this account, our travellers were unable to advance into it much beyond a quarter of a mile, but as far as they went they found it to preserve the same direction, breadth, and height, as at the entrance. To the same feeling on the part of the Indians the guacheros owe their safety; they would otherwise have been pursued into their retreats, and destroyed long ago. On the present occasion, two specimens of the bird were obtained by shooting at random in the dark.

The travellers remained some days at the convent of Caripe, actively engaged in examining the natural features and productions of the surrounding country. On the 22nd of September, they took their departure, and began to descend the mountains, towards the sea-coast. They passed in safety a very steep and slippery declivity, to which the missionaries had given the name of Purgatory, and down which the mules are accustomed to slide boldly, drawing back their bodies over their hind legs. They soon afterwards entered a dense forest, that of Santa Maria,—and were for some time occupied in descending through a ravine by a path formed of steps two or three feet high. The mules leaped down like goats; but our travellers, less confident than the natives, preferred walking to remaining in the saddle during this hazardous operation.

The trees in the forest of Santa Maria attracted attention, from their vast size. Some were seen whose height exceeded 130 feet, and others, whose diameter was upwards of nine feet. The splendour and magnificence of the vegetation were remarkable. The ferns assumed the form and magnitude of trees; and five

new arborescent species of this plant were discovered here, while, in the days of Linnæus, botanists were acquainted with only four on the two continents.

“Fern-trees,” says Humboldt, “are observed to be generally much more rare than palms, nature having confined them to mild, humid, and shady situations. They shun the vertical rays of the sun; and, whilst the *Pumos*, the *Corypha* of the Steppes, and others of the palm tribe of America, delight in the open burning plains, these arborescent ferns, which viewed afar off look like palms, retain the characteristics and habits of cryptogamous plants. They prefer solitude, twilight, and a moist, temperate, and stagnant atmosphere. If, occasionally, they descend toward the coast, it is only under the safeguard of a dense shade. The old trunks of the *Cyathea* and *Meniscium* are coated with a coal-like powder, which (free, perhaps, from hydrogen,) has a metallic lustre like graphite: no other species of vegetation presented this phenomenon; for the trunks of the *Dicotyledons*, notwithstanding the fierce heat of the climate, and the intensity of the light, are not blackened so much between the tropics as in the temperate zone. The trunks of the ferns, which, like the *Monocotyledons*, increase in bulk by the remains of the petioles, may be said to commence their decay towards the centre, and that, being deprived of cortical vessels, by which the elaborated juices descend to the roots, they are more readily charred by the oxygen of the atmosphere. I brought to Europe specimens of these lustrous metallic powders, taken from very old trunks of *Meniscium* and *Aspidium*. As we progressively descended the mountain of Santa Maria, we found the ferns diminish, and the number of palms increase.

The beautiful large-winged butterflies, the *Nymphalæ*, which fly to an amazing height, became more frequent. Everything announced our approach to the coast."

After a toilsome journey, they arrived in the evening at the mission of Vera Cruz; and on the following day, resuming their route towards the sea-coast, reached the station of Catuaro, occupying a wild and romantic situation in the midst, as it were, of a forest. Lofty trees still surrounded the church, and, at night-time, the tigers prowled about the settlement, in quest of the hogs and poultry of the Indians. They lodged at the house of the missionary, a doctor in theology, described as a little meagre man, of a petulant vivacity, querulous, dissatisfied, and possessed of an unhappy passion for what he called metaphysics. He talked continually of a law-suit, in which he was engaged with the superior of his convent, and was anxious to know what Humboldt thought of free-will, and the souls of animals. The corregidor of the district furnished them with three Indians, to assist in cutting a way through the close vegetation of the forests; and the missionary, accompanying them on the road, explained his peculiar notions concerning the innate wickedness of blacks, and the benefits which they derived from being kept in a state of slavery by Christians.

After a fatiguing march, our travellers reached the town of Cariaco, seated upon the gulf of that name. Here they found a large number of the inhabitants suffering from intermittent fevers, which sometimes assumed a malignant character. The situation of the place accounts for its unhealthiness; it lies low, the heat and moisture are excessive, and the stagnant marshes generated in the surrounding district during the rainy season, are a fertile source of noxious exha-

lations. Humboldt particularly regretted the insalubrity of Cariaco, as many of its inhabitants appeared to possess more easy manners and more enlarged ideas than those of any other place which he had visited.

Thinking it prudent to leave Cariaco, as soon as possible, our travellers departed for Cumana early in the morning, embarking on the Gulf of Cariaco. Their voyage was disagreeable in consequence of the unfavourable nature of the weather and the crowded state of their narrow canoe, which carried, besides passengers, raw sugar, plantains, and cocoa-nuts. The cocoa-tree is cultivated to a very considerable extent on the shores of this gulf; whole plantations of it being seen there. It is in the vicinity of the sea that this kind of palm is found to prevail in the greatest abundance; and Humboldt says, that when it is planted in the Missions of the Orinoco, a certain quantity of salt is always thrown into the hole which receives the nut. He observes, likewise, that of the plants cultivated by man, only the sugar-cane, the plantain, the mammea-appel, and the alligator-pear, enjoy in common with the cocoa, the property of enduring irrigation with fresh or with salt water.

In the part of Humboldt's Narrative which we have now reached, some space is devoted to an account of the different native tribes inhabiting New Andalusia, and more especially of the Chayma Indians, among whom his late excursion had chiefly lain. In this part of the new continent, the aborigines still form a large proportion of the scanty population. In the temperate regions of North America, the indigenous population has dwindled away in proportion as the white men have advanced among them; in the equinoctial regions of South America, the same results have not followed.

In the former, the Indians, averse to agriculture, live by hunting, and therefore require for their subsistence a vast extent of country; the encroachments of Europeans, narrowing their territory, have diminished their means of subsistence, and consequently their numbers. In South America, on the other hand, where agriculture existed long before the arrival of Europeans, and still exists in districts in which they have not yet established themselves, a small tract affords subsistence to a large population; therefore the intrusion of Europeans has not affected them in the same manner as in North America. In parts of Central America, where under the old Mexican empire, agriculture was practised for centuries before the arrival of Europeans, and more generally resorted to as affording the means of subsistence than in the equinoctial regions of South America, the Indians constitute a much larger proportion of the population.

The missions established in New Andalusia since the middle of the seventeenth century, have been the means of reducing the Indians to a sort of civilization. The difference between the *wild* and the *civilized* Indians is not, however, always such as the words would imply. Many of the former live by agriculture; and many of the latter, though they have been baptized, are as little entitled to the appellation of Christians as their heathen brethren. By means of the missions, civilization has advanced from the coast towards the interior; the planters have followed in the train of the missionaries, villages have been formed about the missions, and the manners and language of the original inhabitants have been giving way before those of their European masters. Fourteen different tribes of Indians are mentioned as inhabiting the provinces of New Andalusia and Bar-

celona; and even in the missions, they retain their characteristics unchanged, although they all there lead the same kind of life. There is nothing particularly remarkable in the habits of these tribes. The Guaranos who inhabit the delta of the Orinoco are worthy of notice, on account of the singularity of their dwellings, which are elevated on trees, in order to gain security from the inundations of the river. The nature of their country enables them to enjoy a greater degree of independence than other tribes.

Humboldt concludes his notice of this subject with some interesting remarks concerning the supposed influence of climate, and other external agents upon the colour of races. In speaking of the division of the natives of the New World into two classes,—the Esquimaux, whose skin is originally white,—and the copper-coloured class, which includes all the others,—he says, “Those nations which have white skins begin their cosmogony with white men; according to them, negroes and dark-coloured people have been blackened or embrowned by the intense heat of the sun. This theory, adopted by the Greeks, though not without opposition, has descended to our own times. Buffon has repeated in prose what Theodectes said in verse two thousand years before, ‘that nations wear the livery of the climates they inhabit.’ If history had been penned by Negroes, they would have maintained what Europeans themselves have latterly advanced, that man was originally black, or of a deep olive colour; that he became white in some races, by civilization and progressive deterioration, in the way that animals in the domestic state pass from dark to lighter shades. In plants and animals, accidental varieties formed under our own eyes are become fixed, and are propagated

without alteration; but in the present state of human organization, there is no proof of the different races of men, black, yellow, copper-coloured, and white, deviating materially from the primitive type by the influence of climate, food, or other exterior agents." Referring to the Spanish traveller and philosopher, Ulloa, our author continues: "This learned man has seen the Indians of Chili, of the Andes, of Peru, of the scorching coasts of Panama, and also those of Louisiana, which is situated under the northern temperate zone. He had the advantage of living at a period when theories were not so common as in the present day; and, like me, he was surprised at finding the indigenous native, under the line, as dark and swarthy in the cold region of the Cordilleras as in the plains. When we observe differences of colour, they are peculiar to the race. We shall presently find on the fiery banks of the Orinoco, Indians with skins inclining to white."

CHAPTER IV.

Residence at Cumana—The travellers attacked by a Zambo—Eclipse of the sun—Singular phenomena—an earthquake—Remarkable display of fire-balls and falling stars.

[1799.]

AFTER their return to Cumana, our travellers remained in that city for a month, engaged in preparing for the long expedition which they were about to undertake on the Orinoco and the Rio Negro. Their stay afforded them an opportunity of observing an eclipse of the sun, and of comparing the result with the chronometer,—an advantage of great importance, considering that one of

the main objects of their journey was to determine with precision geographical positions. An accident, however, had well nigh marred their hopes. On the evening of the 27th of October, (the day preceding the eclipse), the travellers went out to take the air according to their practice. Crossing the beach which separates the suburb of the Guayquerias from the landing-place they heard the sound of footsteps behind; turning round, they beheld a tall Zambo, who advancing quickly, flourished a great palm tree over Humboldt's head. The latter leaped aside, and avoided the formidable weapon; Bonpland, less fortunate, was felled to the earth by a blow on the temple. After Humboldt had assisted his companion to rise, the two pursued their assailant, who had run off with the hat of one of them; the ruffian on being seized drew a long knife from his trousers, but as some Biscayan merchants, who had been walking on the shore, advanced to the travellers' aid, he again took to flight, and sought refuge in a cow-house, whence he was conducted to prison. Bonpland had a fever in the night, but quickly recovered. The Zambo afterwards made his escape from prison, and the motive of his attack was never ascertained.

On the 28th the eclipse occurred; for several days, both before and after it, some very remarkable atmospheric phenomena were observed. It was the season of what is called winter in those countries; that is to say, of clouds and slight electric showers. From the 10th of October to the 3d of November, a reddish vapour rose in the evening above the horizon, and covered, in a few minutes, as with a veil, the whole vault of the heavens. This mist sometimes disappeared in the night for a time, when masses of brilliantly white clouds formed in the zenith, once so transparent that even

the smaller stars were seen through it, and the spots on the moon were clearly distinguished.

“From the 28th of October, to the 3rd of November,” says Humboldt, “the reddish mist had become denser than it had yet been; the heat of the night was oppressive, although the thermometer was no higher than seventy-eight degrees. The breeze which generally cools the air about eight or nine at night, did not spring up. The atmosphere appeared on fire; and the burnt and dusty ground was cleft in all directions. On the 4th of November, about two in the afternoon, thick clouds of extraordinary blackness enveloped the lofty mountains of the Brigantine and the Tataraqual. They extended by degrees to the zenith. About four, we heard sharp and broken thunder over our heads, though at immense height. At twelve minutes past four, the moment of the strongest electric explosion, there were two shocks of an earthquake; the second followed after an interval of fifteen seconds. The people ran shrieking into the streets. Mr. Bonpland, who was leaning over a table examining some plants, was almost thrown down. I felt the second shock violently, though lying stretched in my hammock. What is rare at Cumana, its direction was from north to south. Some slaves, who were drawing water from a well more than twenty feet deep, close to the Rio Manzanares, heard a report like the explosion of a strong charge of gunpowder. It seemed to come from the bottom of the well; a very singular phenomenon, though sufficiently known indeed in most of the countries of America that are subject to earthquakes.”

A few minutes before the first shock, there was a violent gust of wind; large drops of rain, an electric shower followed, and then succeeded a dead calm,

which continued all night. In this thick gloom, the setting of the sun, with its disc enormously enlarged, distorted and undulating, against a back-ground of the colour of indigo, displayed a scene of extraordinary magnificence. The edges of the clouds were gilded, and the sky exhibited rays of the prismatic colours in extreme brilliance. About nine o'clock, a third shock was felt, much weaker than either of the preceding shocks, but accompanied by a subterranean noise. The inhabitants regarded the shocks of the earthquake, the accompanying thunder, and the red vapour which had been seen for so many days, as being all the effect of the eclipse; the night preceding, the red vapour had been so thick that the moon's place could be distinguished only by a large and beautiful halo. Not two years before this period, the city of Cumana had been almost wholly destroyed by an earthquake, and it was therefore not surprising that the people who looked upon the red mist and the failure of the evening breeze, as unfailing prognostics of disaster, should upon the present occasion, regard those phenomena accompanied by actual shocks, as the certain predecessors of another fatal calamity. Our travellers, whose reputation for science had already spread, were visited by many persons anxious to know whether their instruments indicated an approaching renewal of the shocks. On the following day, the gust of wind and the thunder recurred at exactly the same hour, unaccompanied, however, by any agitation; and the same phenomena were repeated for several days. This was the first earthquake which Humboldt had felt, and it made a strong impression upon him; but he afterwards became familiar with this terrific display of nature, until it excited in him little apprehension.

A few days afterwards, there occurred another phenomenon which powerfully attracted the attention of the scientific travellers. The red vapour had ceased to obscure the sky on the evening of the 7th of November, and the atmosphere then re-assumed its usual purity. On the morning of the 12th, between two and three o'clock, Bonpland, who had risen to enjoy the freshness of the air, observed in the east a number of falling meteors of a very extraordinary kind. For the space of four hours, thousands of fire-balls and falling stars succeeded each other, preserving an invariable direction of from north to south. So numerous were they, that for about thirty degrees on each side of the east point, (or throughout a third of the heavens), there was not a space equal in extent to three diameters of the moon, which was not at every moment filled with them. All these meteors left long, luminous traces, the phosphorescence of which continued for seven or eight seconds. Many of the falling stars had a very distinct nucleus or body, from which proceeded sparks of extremely vivid splendour; the fire-balls appeared to burst as if by explosion, but the largest of them disappeared without scintillation. As the inhabitants of Cumana had risen before four o'clock to attend the first mass, they were witnesses of these phenomena which excited great alarm in the minds of the older portion, who called to mind that the dreadful earthquake of 1766 had been preceded by similar appearances. As the morning advanced, the meteors became more rare; yet even for a quarter of an hour after sunrise, there were a few distinguishable by their splendid white light, and the rapidity of their motion; a circumstance considered, however, by Humboldt as the less extraordinary, since in 1788, in

the city of Popayan, the interior apartments of the houses were strongly illuminated in the middle of the day by an enormous aërolite.

Some time afterwards, when our travellers were engaged in their great expedition to the Rio Negro, they found that these meteors had been observed as far as the borders of Brazil under the equinoctial line, and compared to artificial fire-works. But this was nothing to what they learnt on their return to Europe; namely, that the meteors of the 12th of November had been visible over a portion of the globe comprising sixty-four degrees of latitude, and ninety-one degrees of longitude, having been seen, from various parts of the American continent, between the equator and Labrador,—likewise in Greenland,—and in Europe, near the German town of Weimar. From these facts, it was calculated that the height of the meteors above the earth's surface exceeded 1400 miles; and it was also inferred that they fell into the sea between Africa and South America to the west of the Cape Verd Islands. These deductions proceed upon the assumption that the meteors seen from so many places so remotely apart were the same; but their identity has been questioned by some, to whom it seems that their simultaneous appearance may be ascribed with far more probability to an identity of atmosphere, than of bodies moving through that atmosphere, at such distances from the earth's surface; as, according to the present state of our knowledge, it seems doubtful whether light or heat, or substance of any kind, could be sustained in a state so very much attenuated as it must necessarily be at such a height. Humboldt found falling stars to be more frequent in the equinoctial regions than in the temperate zone.

“Those natural philosophers,” he says, “who have of late instituted such elaborate investigations into the nature of falling stars and their parallaxes, consider them as meteors belonging to the extreme limits of our atmosphere; as placed between the region of the aurora borealis and that of the lightest clouds. Some have been seen not higher than fourteen thousand toises, about four leagues; the most elevated appeared not to exceed thirty. They are frequently more than a hundred feet in diameter; and such is their rapidity, that they traverse a space of two leagues in a few seconds. Some have been measured which had a direction almost perpendicular, or which formed an angle of fifty degrees with the vertical line. This very remarkable circumstance led to the conclusion that falling stars are not *aërolites*, which after floating a long while in space, like the heavenly bodies, take fire upon accidentally entering our atmosphere and fall to the earth.”

CHAPTER V.

Departure from Cumana—Sensations on leaving it—Voyage along the coast—Unhealthiness of the low shores—Influence of mangroves, and other trees in causing it—Situation of La Guayra—Its excessive heat—Introduction of the yellow fever therein—Road thence to Caraccas.

[1799.]

ON the 18th of November, our travellers left Cumana on their main expedition. They proposed to proceed by sea to the town of La Guayra, which lies about three degrees westward; then to take up their abode in the neighbouring city of Caraccas until the termination of the rainy season, when they would pass into the interior, and ascend the Orinoco as far as its junction with

the Rio Negro; and descending the same river to Angostura, the capital of Spanish Guiana, thence return across the Llanos, or great plains, to the coast. They embarked in the evening, in one of the open boats which are employed in trading to the West India islands, and quickly descended the stream of the Manzanares, the sinuosities of which are marked by cocoa-trees, as the windings of a river in our climate are by poplars and willows. The thorny bushes on its banks glitter in the night with luminous insects, although in the day-time they present nothing but leaves covered with dust. The number of phosphorescent insects is greatly increased during the stormy months; and it is then delightful, says Humboldt, to observe the effect of these moving and deep red fires, which, reflected by the pellucid water, confound their figures with those of the starry vault of heaven.

“We left the shores of Cumana,” continues our author, “as if we had been old inhabitants. It was the first spot we had touched under a zone on which my thoughts had been fixed from my earliest youth. Nature, under the climate of the Indies, gives birth to an impression so deep and powerful, that, after a few months’ stay, we seem to have lived there a long succession of years. In Europe, the inhabitants of the north, and of plains, experience a similar sensation, when quitting, even after a transient visit, the shores of the Gulf of Naples, the delightful country between Tivoli and the Lake of Nemi, or the wild and awful scenery of the Upper Alps and the Pyrenees. Yet throughout the temperate zone, there is but little contrast in the vegetable world. The pines and oaks which top the mountains of Sweden have a certain family likeness to those which flourish under the genial

climes of Greece and Italy. Between the tropics, on the contrary, in the lower regions of the two Indias, the whole face of nature is new and wonderful. In the plains, or in the gloom of the forests, the remembrance of Europe is almost effaced; for it is by vegetation that the character of scenery is determined; it is this which acts upon the imagination by its mass, by the contrast of its forms, and by the splendour of its colours. Our new impressions, in proportion to their strength and freshness, destroy those we have hitherto received. Their force gives them the semblance of age. I appeal to those who, more sensible to the beauties of nature than to the charms of social life, have spent much time in the torrid zone. With what fond remembrance do they cherish for the remainder of their days, the spot where they first planted their foot! A vague desire of seeing it again lingers in their thoughts to the most advanced period of life. Even now, Cumana and its dusty soil are oftener present to my imagination than all the wonders of Cordilleras. Under the soft sky of the south, the earth, even when nearly destitute of vegetation, derives beauty from the light and enchanting hues of the atmosphere. The sun does not merely illumine every object it colours, it throws round it an ethereal vapour, which, without affecting the transparency of the air, renders the tints more harmonious, tempers the power of the light, and sheds throughout nature that calm which is reflected on our souls. To explain this vivid impression, excited by the scenery of the two Indies, and this too upon coasts but thinly wooded, it may be sufficient to recal to mind, that the beauty of the sky from Naples to the equator, augments almost as much as from Provence to the south of Italy."

The class of boats in one of which Humboldt had

embarked, are thirty feet long, and not more than three feet high at the gunwale; they have no decks, and their lading is generally from 200 to 250 quintals. The sea is extremely rough between Cape Codera and La Guayra, and the boats carry an enormous triangular sail which might be thought somewhat dangerous when gusts issue from the passes of the mountains, in sailing along the shore; nevertheless, during thirty years there had not been one of these boats lost in the passage from Cumana to La Guayra. The skill of the Guaiqueria* pilots is so great that shipwrecks are very rare, even in the frequent trips which they make from Cumana to Guadaloupe, or the Danish islands surrounded by breakers.

“These voyages of 120 or 150 leagues,” says Humboldt, “in an open sea, out of sight of land, are performed in boats without decks, in the manner of the ancients, without any observations of the meridian altitude of the sun, without charts, and, generally, without a compass. The Indian pilot directs his way at night by the pole-star, and in the day by the course of the sun and the wind, which he believes to be little variable. I have seen Guaiquerias and pilots, of the coast of the Zamboes, who could find the pole-star by the direction of the pointers, *alpha* and *beta* of the Great Bear; and they seemed to me to steer less from the view of the pole-star itself, than from the line drawn through these stars. It is surprising, that, at the first sight of land, they can find the island of Guadaloupe, Santa Cruz, or Porto Rico; but the compensation of the errors of their course is not always equally fortunate. The boats,

* This tribe of Indians are the most able and intrepid fishermen of New Andalusia; they inhabit the island of Margaretta, the peninsula of Aaraya, and that suburb of Cumana which bears their name.

if they fall to leeward in making land, beat up with great difficulty to the eastward, against the wind and the current. The pilots, in time of war, often pay dearly for their ignorance, and their neglect of the quadrant, since the privateers cruize near those very capes which the boats of Terra Firma, when they miss their course, are obliged to make, in order to find out where they are."

Embarking, then, in one of these boats, our travellers descended the stream of the Manzanarez, and, passing through its mouth, entered the Gulf of Cariaco. They soon enjoyed one of those beautiful sights which the phosphorescence of the ocean in tropical climates so often exhibits. The porpoises followed the boats in bands consisting of fifteen or sixteen; and as, in turning over, they struck the surface of the water with their tails, they produced a brilliant light, as of flames rising out of the sea. Each troop left behind it a luminous track, and as few sparks followed from the stroke of an oar, or the track of the boat, Humboldt supposed that the vivid phosphorescence which these animals occasioned was owing not merely to the stroke of their tails, but also to the gelatinous matter which envelopes their bodies, and which is detached by the waves.

At midnight, they found themselves between some barren and rocky islands, rising like bastions in the middle of the sea, and forming two groups, called respectively the Caraccas, and Chimanas. The moon was above the horizon, and lighted up those cleft rocks, bare of vegetation, and of a fantastic aspect; their height, which probably does not exceed 150 toises, then appeared very considerable. All these islands were entirely uninhabited; but upon one of the Caraccas were found wild goats, of a large size, brown, and

extremely swift. "Our Indian pilot assured us," says Humboldt, "that their flesh has an excellent flavour. Thirty years ago, a family of whites settled on this island, and cultivated maize and cassava. The father alone survived his children. As his wealth had increased, he purchased two black slaves, and this was the cause of his misfortunes. By his slaves he was murdered. The goats became wild, but the cultivated plants did not. Maize in America, like wheat in Europe, connected with man since his first migrations, appears to be preserved only by his care. We sometimes see these nourishing gramina disseminate themselves; but when left to nature the birds prevent their reproduction by destroying the seeds. The two slaves of the isle of Caraccas long escaped punishment: it was difficult to ascertain a crime committed in so lonely a spot. One of these blacks is now the hangman at Cumana. He informed against his accomplice, and an executioner being wanted, he obtained pardon, on condition, according to the barbarous custom of the country, of hanging all the prisoners on whom sentence of death had been pronounced long before. It seems difficult to believe that there are men sufficiently ferocious to preserve their lives at this price, and execute, with their own hands to-day those whom they informed against yesterday."

Our travellers anchored for a few hours in the road of New Barcelona, at the mouth of a river abounding in crocodiles, and went on shore for a short time. Resuming their voyage, at noon on the 19th, they found the sea become more agitated as they approached the formidable promontory, known by the name of Cape Codera, beyond which the water is generally much disturbed. The sickness of some of the pas-

sengers, and the pilot's dread of privateers, induced them to anchor, on the morning of the 20th, in the Bay of Iliguerota, within about seven miles of Cape Codera.

The sea was so shallow, that the smallest boat could not go close to the shore, and wading was an indispensable preliminary to landing. The travellers found a few huts inhabited by fishermen, whose livid complexion, together with the wretched appearance of their children, sufficiently indicated the unhealthiness of the spot. Its insalubrity was attributed to the exhalations from the mangroves which, with other trees covered the beach, and imparted to the water in contact with them a yellowish-brown tint, forming a distinct belt, along the coast. A faint and sickly smell was perceptible, such as is generally noticed among mangroves, and which many have supposed to arise from sulphuretted hydrogen, disengaged in some process of decomposition. Humboldt collected some branches and roots, and, on his arrival at Caraccas, instituted experiments, the result of which led him to think that the unhealthiness was occasioned by the action of the moistened bark and fibre of the mangrove upon the atmosphere, and not of the brownish water that washed the shore. He observes, however, that noxious exhalations would always arise from a thick wood covering a muddy soil, even if the trees composing it possessed in themselves no deleterious property.

"Whenever," he adds, "mangroves grow on the margin of the sea, the beach is peopled with multitudes of mollusca and insects. These animals prefer the shade and a faint light, and find shelter from the waves among the closely-interlaced roots, which rise, like lattice-work, above the surface of the water; shells attach themselves to the roots, crustaceous animals

nestle in the hollow trunks; the sea-weeds, which the wind and tide drive upon the shore, remain hanging upon the recurved branches. In this manner the maritime forests, by accumulating masses of mud among their roots, extend the domain of the continent; but, in proportion as they gain upon the sea, they scarcely experience any increase in breadth, their very progress becoming the cause of their own destruction. The mangroves, and the other plants with which they always associate, die as the ground dries, and when the salt-water ceases to bathe them. Centuries after, their decayed trunks, covered with shells and half-buried in the sand, mark both the route which they have followed in their migrations, and the limit of the land which they have wrested from the ocean."

The passengers who had accompanied our travellers from Cumana, disliking to encounter the rough sea through which lay the rest of the voyage, resolved to proceed to Caraccas by land. Bonpland followed their example; while Humboldt, continuing the voyage, in order to take care of the instruments which had been embarked in the boats, reached La Guayra on the 21st of November. The place is described by him as being rather a road than a harbour: it affords little protection to ships, the loading of which is a task of difficulty.

The sea is constantly agitated, and the ships suffer at once by the action of the wind, the tideways, the bad anchorage, and the worms. The lading is taken in with difficulty, and the height of the swell prevents the embarkation of mules, as at New Barcelona and Porto Cabello. The free mulattoes and negroes, who carry the cacao on board the ships, are a class of men of very remarkable muscular strength. They go up to their middles through the water, and, what is well worthy of



The Mangrove Tree



attention, they have nothing to fear from the sharks which are so frequent in this harbour. "This fact seems connected," says Humboldt, "with what I have often observed between the tropics, relative to other classes of animals that live in society, for instance, monkeys and crocodiles. In the missions of the Orinoco, and the River of Amazons, the Indians, who catch monkeys to sell, know very well that they can easily succeed in taming those which inhabit certain islands; while monkeys of the same species, caught on the neighbouring continent, die of terror or rage, when they find themselves in the power of man. The crocodiles of one pool in the Llanos are cowardly, and flee, even in the water; while those of another, attack with extreme intrepidity. It would be difficult to explain this difference of manners and habits by the aspect of their respective localities. The sharks of the port of La Guayra seem to furnish an analogous example. They are dangerous and blood-thirsty at the island opposite the coast of Caraccas, at the Roques, at Bonaire, and at Curassao; while they forbear to attack persons swimming in the ports of La Guayra and Santa Martha. The people, who, in order to simplify the explanation of natural phenomena, always have recourse to the marvellous, affirm that in both these places a bishop gave his benediction to the sharks."

The city is compared with Santa Cruz, in Teneriffe; it stands on a strip of level ground, scarcely 650 feet broad, between the sea and a wall of steep rocks, and consists of two parallel streets. It has an appearance somewhat lonely and melancholy, seeming rather to be part of a rocky island, destitute of soil and vegetation, than to belong to a continent abounding in vast forests. The heat is excessive, owing in some degree to the

faintness of the sea-breeze, and the radiation from the rocks behind the town. From a series of thermometrical observations, it appeared that La Guayra was one of the hottest places on the globe. Its mean temperature for the year, together with that of some other places, is given in the following list.

La Guayra	82·6° (nearly)	Rio Janerio.....	74·3°
Cumana	81·8°	Santa Cruz (Teneriffe)	71·4°
Vera Cruz	77·7°	Cairo	72·3°
Havannah	78·1°	Rome.....	60·4°

Yet, though extremely hot, La Guayra was not considered to be remarkably unhealthy. The mortality had never been considerable; the confluence of strangers on the coast of Caraccas was less than at the Havannah and at Vera Cruz. A few individuals, even Creoles and Mulattoes, were sometimes taken off suddenly by certain irregular remittent fevers; they were generally men employed in the laborious task of cutting wood in the forests. The malady, however, which attacked them was not propagated; and nowhere on the coast of Caraccas, had the real typhus of America, known as the black vomit and the yellow fever, been observed. Indeed, the only places at which this peculiar disease was known, on the whole coast of Terra Firma, were Porto Cabello, Carthagená, and Santa Martha. Spaniards newly arrived from the mother country were not afraid to reside at La Guayra, although they complained of the excessive heat which prevailed during a part of the year; and many persons preferred its ardent but uniform climate, to the cool but extremely variable climate of Caraccas.

“Since the year 1797, everything has changed. Commerce being opened to other vessels than those of the mother country, seamen born in colder climates

than Spain, and consequently more sensible to the impressions of the climate of the torrid zone, began to frequent La Guayra. The yellow fever declared itself; North Americans, seized with the typhus, were received in the Spanish hospitals; and it was affirmed that they had *imported* the contagion, and that, before they entered the road, the disease had appeared on board a brig which came from Philadelphia. The captain of the brig denied the fact, and asserted, that, far from having introduced this malady, his sailors had caught it in the port. We know, from what happened at Cadiz in 1800, how difficult it is to elucidate facts when their uncertainty serves to favour theories which are diametrically opposed. The more enlightened inhabitants of Caraccas and La Guayra divided in opinion, like the physicians in Europe and the United States, on the principle of contagion of the yellow fever, cited the instance of the same American vessel, to prove, some that the typhus fever came from abroad, and others that it took its birth in the country itself."

Those who embraced the latter supposition, or that of the indigenous origin of the disease, refer to an extraordinary alteration caused in the constitution of the atmosphere of La Guayra by the overflowing of its river shortly before. This torrent,—the Rio de la Guayra,—which, in general, is not ten inches deep, was swelled, after sixty hours' rain in the mountains, in so extraordinary a manner, that it bore down trunks of trees, and masses of rock of considerable size. The depth of its waters became eight or ten feet, and their breadth thirty or forty. Many houses were carried away: and the inundation became more dangerous to the stores, in consequence of the gate of the town, where alone the waters could have found an issue,

being accidentally shut. It was necessary to make a breach in the wall on the side of the sea: more than thirty persons perished, and the damage was computed at half a million of piastres. The stagnant waters which infected the stores, the cellars, and the dungeons of the public prison, doubtless diffused miasmata, which, as predisposing causes, may, Humboldt thinks, have accelerated the developement of the yellow fever; but the river cannot, in his opinion, be regarded as the primary cause. At all events, whatever may have been the cause, it is certain that, since 1797, La Guayra has never been free from the visitations of this dreadful scourge, which has there proved very fatal to strangers, —as well Europeans newly arrived, as natives of the hot plains in the interior of South America.

The road leading from La Guayra to Caraccas is said to resemble the passages of St. Gothard and the Great St. Bernard, over the Alps; the journey, however, is performed by mules in three hours, the distance being about twenty miles. The ascent is steep and laborious; at a point called the *Salto*, or leap, there is a crevice which is crossed by a drawbridge. Towards the summit is *La Venta de Guayavo*, or the Inn of Guayavo, a sort of halting-place; and on the summit itself, which bears the name of *Las Vueltas*, there are fortifications. On reaching the highest point, the road passes over a smooth table-land, from which the city of Caraccas is descried in a beautiful valley nearly 2000 feet lower.

“The first time,” says Humboldt, “of my crossing this table land on my way to the capital of Venezuela, I found a number of travellers, who were resting their mules, assembled round the little inn of Guayavo. They were inhabitants of Caraccas, and were wrangling about the insurrection in favour of independence, which

had taken place a little time before. Joseph Espana had perished on the scaffold, and his wife was groaning in a cloister, for giving shelter to her wandering husband, and not denouncing him to the government. I was struck at the irritation of their minds, and with the acrimonious discussion of questions, upon which there ought never to be a difference of opinion among men of the same country. Whilst talking of the hatred of the mulattoes to the free negroes and the whites, of the wealth of the monks, and of the difficulty of holding the slaves in subjection, a cold wind, descending from the lofty summit of the Silla of Caraccas, enveloped us with a thick mist, and put an end to the angry dispute. We took shelter in the Venta of Guayavo. Upon entering the house, an old man, who had spoken with more calmness than the others, reminded them how imprudent it was, in these times of secret accusation, both on the mountain and in the city, to enter into political discussions. These words, delivered in a place so dreary, made a deep impression upon my mind; during our excursions to the Andes of New Granada and Peru, impressions of the same kind were frequently renewed. In Europe, where nations decide their quarrels in plains, people climb the mountains, to find seclusion and liberty. In the New World, the Cordilleras are inhabited twelve miles up; yet thither men carry with them their civil broils, and their low and hateful passions. Gambling-houses are established on the ridge of the Andes, on the spot where the discovery of mines has led to the formation of cities; and in these vast wildernesses, almost above the region of snow, surrounded by objects calculated to elevate the mind, the news of the refusal by the court of a ribbon, or a title, often disturbs the happiness of whole families."

CHAPTER VI.

The city of Caraccas—Physical and social aspect of Venezuela—Native population—Description of Caraccas—Its climate—The adjoining mountains—Character of the inhabitants—Excursion to the summit of the Silla—Difficulties of the journey—View from the summit—The descent—Gold and silver mines of Venezuela.

[1799.]

At the present day, Caraccas is the capital of Venezuela, one of the three independent states which were formed a few years ago upon the breaking up of the great federal republic of Colombia: the others being New Granada and Ecuador. During the existence of that republic, Caraccas was the chief city of a district of the same name. Previous to its formation, and while the authority of the mother country prevailed, Caraccas was the capital of a vast territory, known by the Spanish government as the *Capitania General de Caraccas*, and containing nearly a million of inhabitants, distributed among seven provinces; namely, those of New Andalusia, or Cumana, Barcelona, Venezuela, or Caraccas, Coro, and Maracaybo, on the coast; and those of Varinas and Guiana, in the interior. It was this political rank which Caraccas held when our travellers visited it.

In its physical aspect, Venezuela presents three remarkable divisions: distinct belts, as it were, stretching in the direction of its length, that is to say, from east to west. There is first, the belt of cultivated land, lying along the shore and at the foot of the mountains which approach it; secondly, the belt of savannahs or pasturages, lying behind the first; and thirdly, farthest from the coast, the belt of forests, a dense mass, penetrable only by means of the rivers which traverse it. In these three zones, Humboldt sees the picture of

the three principal conditions of human society, more strongly marked than in any other region,—namely, the life of the wild hunter, in the woody region; the pastoral life, in the savannahs or plains; and the agricultural life, in the cultivated district near the coast.

The innermost of these three zones is described by Humboldt as presenting a melancholy picture of misery and privation; it is a region in which the “strong right arm of power” exercises a predominant influence. On the southern or extreme frontier, were a few advanced posts occupied by missionaries and soldiers. The Indian tribes were engaged in perpetual hostilities; the interference of the monks increased the dissensions among the natives; and the soldiers were always quarrelling with their ecclesiastical auxiliaries. In the pastoral region a tame uniformity prevails, the means of subsistence are extremely abundant, and the inhabitants living in huts partly covered with skins, exhibit little tendency towards civilization. The district of cultivated land is of course the most civilized; indeed, nothing indicating an advanced state of civilization is found except in this district, which extends along the coast upwards of seven hundred miles.

The Indians in the *Capitania* of Caraccas form an inconsiderable part of the population; scarcely more, indeed, than one-ninth. It is observed, that it is only in those parts in which the conquerors found regular and long established governments, as in Mexico and Peru, that the natives form a large proportion of the agricultural residents; in Mexico, for example, the Indians constitute nearly one-half of the whole number. The black slaves are still fewer, forming only one fifteenth of the population; but they become important in consequence of their accumulation in one spot.

The city of Caraccas, which was founded in 1567, is situated at the western end of the elevated valley of Chacao; the ground on which it stands is uneven, and has a steep slope. The small river Guayra flows on the south side, and receives from the adjacent mountains three small streams, which traverse the city, and are crossed by numerous bridges. The streets, which are generally paved, are wide and straight, intersecting each other at right angles. The private houses are well-built, spacious and lofty; some being of brick, but the greater part of masonry. They are arranged after the fashion prevailing in Spain, the street front presenting almost bare walls, with one or two windows, while within are large court yards, into which the apartments open.

The population of Caraccas has undergone great fluctuations within the last century. In 1766, the small-pox carried off from six to eight thousand persons. In 1800, the population was estimated at forty-five thousand, of whom eighteen thousand were whites, and twenty-seven thousand coloured. Before the great earthquake of 1812, the inhabitants amounted to about fifty thousand: but in that great calamity, twelve thousand persons are said to have perished. Civil dissensions, and the war with the mother country, occasioned a further reduction in later years; and the earthquake of 1826, likewise contributed to its diminution. At present the population is about thirty thousand.

Before the earthquake of 1812, the city of Caraccas contained eight churches and five convents. The cathedral, standing in the Plaza Mayer, or Great Square, withstood that terrible commotion, but suffered considerable damage in the earthquake of 1826; it is

described as an extensive and solid edifice, not remarkable, however, for architectural beauty. The theatre is capable of accommodating from one thousand five hundred to one thousand eight hundred persons; the pit, in which the men are separated from the women, is uncovered; so that, as Humboldt says, "we may see at the same time, the actors and the stars."

The climate of Caraccas is a perpetual spring; a national author has compared its site with that of the terrestrial paradise, and recognised in the Guayra river and its tributary torrents, the four rivers which watered the garden of Eden. What, indeed, as Humboldt tasks, can be imagined more delicious than a temperature which ranges in the day-time from 68° to 79° , and in the night from 61° to 64° ; and which is favourable at once to the growth of the banana, the orange, the apple, the apricot, coffee, and wheat corn? Yet the temperature does not possess that stability which is common to places situated within the tropics, and the inhabitants complain of frequent considerable transitions, in the space of twenty-four hours. The difference between the temperature by day and that by night often amounts to 8° or 10° ; and this, though it would but slightly affect us in our temperate climates, produces very unpleasant effects in a tropical region, especially on those who have been accustomed to the uniformity which generally prevails there*.

The proximity of the lofty mountains of Avila and the Silla, imparts a dull and heavy character to the

* The inhabitants of tropical regions are affected by slight changes of temperature, such as in our climates we should scarcely perceive. Mungo Park, in his travels in the hot countries of Africa, noticed the fact, that "the Africans are sensible of the smallest variation in the temperature of the air, and frequently complain of cold when an European is oppressed with heat."

city, especially in the months of November and December, when the evenings are misty. During the latter month, our travellers saw the mountain of the Silla free from clouds only five times. "But this prospect," says Humboldt, "so gloomy, so melancholy,—this contrast between the serenity of morning and the cloudiness of evening, does not exist in the middle of summer. In June and July, the nights are clear and delicious; the atmosphere retains then that unbroken purity and transparency, which are peculiar to the table-mountains, and all the upland valleys in calm weather, so long as the winds mingle no currents of air of a different temperature. It is at this season that one enjoys all the beauty of a landscape which, at the end of January, I never saw perfectly clear, except for a few days. The two round heads of the Silla appear at Caraccas almost under the same angle of elevation, as the Pic of Teneriffe in the port of Orotava. The lower half of the mountain is clothed with a smooth turf; next comes the zone of evergreen shrubs, which a rosy light reflects at the flowering-time of the Befaria; the Alpine Rose-Bay of equinoctial America. Above this woody zone rise two huge rocky masses in the shape of cupolas. Destitute of vegetation, they increase by their nudity the apparent height of a mountain, which, in the temperate part of Europe would scarcely be considered in the line of perpetual snow. This, with the imposing aspect of the Silla, and the rugged disposition of the ground to the north of the town, are agreeably contrasted with the cultivated region of the vale, and the smiling plains of Chacao, of Petera, and La Vega."

The stay of our travellers at Caraccas lasted two months, and they experienced throughout, the greatest

kindness from the inhabitants, whose cheerfulness, affability, and politeness, are spoken of in high terms. They noticed among the people a particular predilection for music, but a sad deficiency in every branch of scientific knowledge. An old man whom they met with in one of the convents, was the only person who had distinct notions on the state of modern astronomy; and he used to calculate almanacs for the whole *Capitania*. There was not even a printing-office in the city; the first was established in 1806, some time after their return to Europe.

An excursion to the summit of the peaked mountain of the Silla, afforded them an opportunity of making many curious observations on the rocks, the vegetation, and the state of the atmosphere. To their surprise, they were unable to find a single individual who had visited the top of that mountain; but being furnished by the governor with negro attendants who knew something of the way, they set out on the 2nd of January, 1800. Passing the night at a coffee plantation, near a ravine, they started early in the morning, and in two hours reached a promontory, from which a narrow ridge or dyke led to the body of the mountain. Proceeding along the ridge, with a deep valley covered with picturesque vegetation on either hand, they reached a point where the inclination became very steep; the ascent was here extremely difficult, the surface being a hard rock, and the short grass affording no support when laid hold of. Up to this point the travellers had been accompanied by several of the citizens of Caraccas, who were desirous of visiting the summit of the Silla; less enthusiastic, however, than our philosophers, their companions quailed before the incipient difficulties of the journey, and retired when

it became arduous to advance. The negro guides, whose loquacity contrasted strikingly with the taciturn gravity of the Indians who had attended the travellers during their excursion among the missions, amused themselves at the expense of the deserters, and especially of a young Capuchin monk, a professor of mathematics, who had promised to fire off rockets from the top of the mountain, by way of announcing to the people of Caraccas, that the ascent had been accomplished.

The mountain which our travellers were ascending, presents at its top, two peaks with a depression between them; from this peculiarity of formation, it has derived the appellation of the *Silla*, or Saddle. The eastern summit being the higher, was of course that to which they directed their course; the only access to it was by the depression already mentioned, and to reach this they were obliged to climb over a part of the western summit. We have said that the season was one in which mists prevailed; and before they reached the body of the mountain, indications of a dense fog were apparent.

The steep and slippery ascent continued until the travellers had reached an elevation of nearly a mile and a quarter above the level of the sea, or three quarters of a mile above the level of the valley in which Caraccas stands. Up to this point, their route lay through savannahs, or pasture-grounds, in which they expected to find a native rose-bush; but here, as afterwards in the Andes, their search proved vain, and Humboldt doubts if this plant is to be found wild in any part of South America, or even of the whole southern hemisphere. When the savannahs terminated, they entered a small forest, where the declivity became less steep, and they were gratified with the sight of rare and

beautiful plants in abundance. Entering another savannah, they crossed a part of the western summit, and descended into the depression separating it from the eastern one, cutting their way through the dense vegetation which they encountered. Suddenly, however, a thick mist surrounded them, and they deemed it prudent to stop, as they were approaching that part of the mountain where it forms a precipice six thousand feet deep. When the negroes who had carried their provisions came up, they partook of a scanty repast of bread and olives.

It was now about two o'clock in the afternoon. Thinking it practicable to reach the summit before sun-set, the travellers resolved to push forwards, and then to return and pass the night in the hollow between the two peaks; with this view they sent back a portion of their attendants to fetch them a supply of salt beef. Suddenly, a strong east wind began to blow, and the vapour which enveloped them disappeared in less than two minutes. They started onwards: and passing close to the great precipice, found themselves in three quarters of an hour, upon the top of the Silla.

“Having gained the summit, we enjoyed, though but for a few minutes, the heavens in all their serenity. Our eyes stretched over a vast extent of country, plunging at once upon the sea in the north, and upon the fertile valley of Caraccas in the south. We were at an elevation of 1350 toises (8633 feet). An expanse of sea, of thirty-six leagues radius, is embraced in one view. Those who are apt to become dizzy, on looking down great depths, should remain in the middle of the small flat on the summit of the eastern cupola of the Silla. The mountain is not remarkably high, being nearly eighty toises lower than that of

Canigou; but what distinguishes it from all the mountains I have crossed, is its immense precipice on the side of the sea. The shore forms but a narrow edging, and, in looking from the top of the pyramid upon the houses of Caravellada, the wall-sided rocks, by an optical illusion of which I have often spoken, appear almost perpendicular. The true inclination of the slope appeared to me, by an accurate calculation, $53^{\circ} 23'$. The mean inclination of the Pic of Teneriffe is hardly $12^{\circ} 30'$. A precipice of six or seven miles, like that of the Silla of Caraccas, is a phenomenon much rarer than is imagined by those who traverse mountains without measuring their height, bulk, or declivity. Since the revival, in several parts of Europe, of experiments upon the fall of bodies, and upon their deflexion to the south-east, a wall-sided rock, 250 toises of perpendicular height, has been sought in vain throughout all the Alps in Switzerland. The slope of Mont Blanc to the Allée Blanche does not make an angle even of 45° , although, in most geological works, Mont Blanc is described as cut straight down on the south."

After a short stay on the summit, in the midst of which a dense fog arose, our travellers began their descent; and, abandoning their original intention of passing the night in the hollow, entered the savannah as it became dark. "As there is scarcely any twilight betwixt the tropics," says Humboldt, "perfect daylight is followed by sudden darkness. The moon was in the horizon; her face was covered from time to time by heavy clouds driven by a cold impetuous wind. The steep declivities, clothed with yellow, withered grass, were at one time wrapped in obscurity, then suddenly illumined; they looked like precipices,



Silver Mine.

which the eye vainly sought to fathom. We proceeded in a long file, endeavouring to assist each other with our hands, to prevent rolling down in case of stumbling. The guides who carried our instruments left us, one by one, to go and sleep in the mountain. Among those who remained, was a Congo negro, who excited my admiration by the skill with which he carried upon his head a large dipping-needle, keeping it always in equilibrium, notwithstanding the great steepness of the rocks. The mist began to clear away from the bottom of the valley. The lights which we saw scattered beneath us produced a double illusion, the steeps seeming still more dangerous than they really were, and, during six hours of continual descent, we constantly fancied ourselves near the farm-houses at the foot of the Silla. We heard, very distinctly, human voices, and the shrill tones of guitars. Generally speaking, so strong is the upward propagation of sound, that, in an aërostatic balloon, the barking of dogs may sometimes be heard at the height of 3000 toises." In illustration of this last observation, it may be mentioned, that at the Cape of Good Hope, from the edge of the Table Mountain, which is 3600 feet high, and the upper part of which rises perpendicularly at the distance of about a mile from Cape Town, every noise made in the town, and even the word of command on the parade, may be distinctly heard.

Venezuela has never produced the precious metals in any abundance. At an early period after the conquest attempts were made by the Spaniards to work gold and silver mines, but were soon abandoned, in consequence of the scanty returns, and the high price of labour. Humboldt, however, thinks that the question, whether Venezuela contains mines worth the

trouble of working them, is by no means decided. He observes, that, although in countries where labour is dear, the care of the government should unquestionably be first devoted to the cultivation of the soil, yet the example of Mexico sufficiently proves that the working of metals does not always impede the progress of agricultural industry. "The most highly-cultivated plains of Mexico," he says, "those which recall to the recollection of travellers the most beautiful fields of France and the south of Germany, extend from Silao towards the Villa de Leon; they border on the mines of Guanaxuato, which alone produce the sixth part of all the silver of the New World."

CHAPTER VII.

Earthquake at Caraccas in 1812—Subterranean commotions in America in 1811 and 1812—Destruction of the city—lamentable loss of life—Exhumation of the wounded—Moral effects of the calamity—Wide extent of the earthquake.

TWELVE years after the visit of our travellers to Caraccas, nine-tenths of the city were destroyed by that most terrible of natural phenomena,—an earthquake. Of this calamitous event, Humboldt collected all the trustworthy information which he could obtain; the result of his inquiries forms one of the most interesting portions of his narrative. At the time of his visit, a general opinion prevailed that the easternmost parts and coasts of the provinces of New Andalusia, New Barcelona, and Caraccas, were the most exposed to the destructive effects of earthquakes. The inhabitants of Cumana dreaded the Valley of Caraccas, on account of its damp and variable climate, and its gloomy and

foggy sky; while the inhabitants of that temperate valley considered Cumana as a town where only a burning air was breathed, and where the soil was periodically agitated by violent commotions. "Cruel experience destroyed, in 1811, the charm of theory and popular opinions. Caraccas, situated in the mountains, three degrees to the west of Cumana, and five degrees west of the volcanoes of the Caribbee Islands, has felt greater shocks than were ever experienced on the coast of Paria, or New Andalusia."

The reader is probably aware, that, sometimes an earthquake is felt over an immense tract of country; that which, a few years ago, destroyed the town of Concepcion, in Chile, extended over thirteen degrees of latitude. The memorable earthquake which almost destroyed Lisbon, on the 1st of November, 1755, was felt in the smaller West India Islands, (the Lesser Antilles,) the shock occurring four minutes later than in the Portuguese capital. In the same islands volcanic eruptions took place in 1797, when Cumana was destroyed by an earthquake. Humboldt was much struck by the connexion between these two events, and he has collected a multitude of facts, to show, what he styles "the relations which link together volcanoes of the same group."

The earthquake of Caraccas, in 1812, was one of a series of subterranean commotions, which, from the beginning of 1811 till 1813, agitated a vast extent of the earth's surface, limited by the valley of the Ohio on the north, the coasts of Venezuela on the south, the Cordilleras of New Granada on the west, and the meridian of the Azores Islands on the east, and thus comprising thirty-one degrees of latitude, and sixty degrees of longitude. In this period, a variety of phenomena

were observed, indicating, apparently, "communications at enormous distances." On the 30th of January, 1811, a submarine volcano began to operate near St. Michael's, one of the Azores; and at a place where the sea was sixty fathoms deep, a rock appeared above the surface. At first, this new islet was nothing more than a shoal, but on the 15th of January, an eruption, which lasted six days, enlarged its extent and carried it progressively to the height of fifty toises. It was taken possession of in the name of the British Government, but afterwards disappeared; having afforded the third example of this extraordinary action of submarine volcanoes, near the Island of St Michael. About the same time, the smaller West India Islands, situated 800 leagues to the southwest of the Azores, experienced frequent earthquakes. From the month of May, 1811, to that of April, 1812, more than 200 shocks were felt in the Island of St. Vincent, one of the three in which there are still active volcanoes. The commotion extended likewise to the portion of the continent north of the Gulf of Mexico. From the 16th of December, 1811, the earth was for some time almost incessantly agitated in the Valleys of the Mississippi, the Arkansas, and the Ohio; the oscillations being accompanied by a great subterraneous noise, coming from the southwest. At places, between New Madrid and Little Prairie, as at the Sabine, north of Cincinnati, in latitude $37^{\circ} 45'$, the shocks were felt every day, nay almost every hour, during several months.

In the month of December, 1811, the town of Caraccas felt the first shock, in calm and serene weather; and this was the only one which preceded the dreadful catastrophe of the 26th of March, 1812.

“The inhabitants of Terra Firma,” says Humboldt, “were ignorant of the agitation which, on the one hand, the volcano of the Island of St. Vincent had experienced, and, on the other hand, the Basin of the Mississippi, where, on the 7th and 8th of February, the ground was, day and night, in a state of continual oscillation. At this period, a great drought prevailed in the province of Venezuela. Not a single drop of rain had fallen at Caraccas, or in the country ninety leagues round, during the five months which preceded the destruction of the capital. The 26th of March was a remarkably hot day. The air was calm, and the sky unclouded. It was Holy Thursday, and a great part of the population was assembled in the churches. Nothing seemed to presage the calamities of the day. At seven minutes after four in the afternoon, the first shock was felt; it was sufficiently powerful to make the bells of the churches toll; it lasted five or six seconds, during which time the ground was in a continual undulating movement, and seemed to heave up like a boiling liquid. The danger was thought to be past, when a tremendous subterraneous noise was heard, resembling the rolling of thunder, but louder, and of longer continuance, than that heard within the tropics in time of storms. This noise preceded a perpendicular motion of three or four seconds, followed by an undulatory movement, somewhat longer. The shocks were in opposite directions, from north to south, and from east to west. Nothing could resist the movement from beneath upward, and undulations crossing each other. The town of Caraccas was entirely overthrown. Thousands of the inhabitants (between nine and ten thousand) were buried under the ruins of the houses and churches. The procession had not yet set out; but the crowd was

so great in the churches, that nearly three or four thousand persons were crushed by the fall of their vaulted roofs. The explosion was stronger towards the north, in that part of the town situate nearest the mountain of Avila, and the Silla. The churches of La Trinidad and Alta Gracia, which were more than one hundred and fifty feet high, and the naves of which were supported by pillars of twelve or fifteen feet diameter, left a mass of ruins scarcely exceeding five or six feet in elevation. The sinking of the ruins has been so considerable, that there now scarcely remain any vestiges of pillars or columns. The barracks, called *El Quartel de San Carlos*, situate farther to the north of the church of the Trinity, on the road from the custom-house de la Pastora, almost entirely disappeared. A regiment of troops of the line, that was assembled under arms, ready to join the procession, was, with the exception of a few men, buried under the ruins of this great edifice. Nine-tenths of the fine town of Caraccas were entirely destroyed. The walls of the houses that were not thrown down, as those of the street St. Juan, near the Capuchin Hospital, were cracked in such a manner, that it was impossible to run the risk of inhabiting them. The effects of the earthquake were somewhat less violent in the western and southern parts of the city, between the principal square and the ravine of Caraguata. There, the cathedral, supported by enormous buttresses, remains standing.

“In estimating at nine or ten thousand the number of the dead in the city of Caraccas, we do not include those unhappy persons, who, dangerously wounded, perished several months after, for want of food and proper care. The night of Holy Thursday presented the most distressing scene of desolation and sorrow. A

thick cloud of dust, which rising above the ruins, darkened the sky like a fog, had settled on the ground. No shock was felt, and never was a night more calm, or more serene. The moon, nearly full, illumined the rounded domes of the Silla; and the aspect of the sky formed a perfect contrast to that of the earth, covered with the dead, and heaped with ruins. Mothers were seen bearing in their arms their children, whom they hoped to recall to life. Desolate families wandered through the city, seeking a brother, a husband, a friend, of whose fate they were ignorant, and whom they believed to be lost in the crowd. The people pressed along the streets, which could no more be recognized but by long lines of ruins.

“All the calamities experienced in the great catastrophes of Lisbon, Messina, Lima, and Riobamba, were renewed on the fatal day of the 26th of March, 1812. The wounded, buried under the ruins, implored by their cries, the help of the passers by, and nearly two thousand were dug out. Never was pity displayed in a more affecting manner; never had it been seen more ingeniously active, than in the efforts employed to save the miserable victims, whose groans reached the ear. Implements for digging and clearing away the ruins were entirely wanting; and the people were obliged to use their bare hands, to disinter the living. The wounded, as well as the sick who had escaped from the hospitals, were laid on the banks of the small river Guayra. They found no shelter but the foliage of the trees. Beds, linen to dress the wounds, instruments of surgery, medicines, and objects of the most urgent necessity, were buried under the ruins. Everything, even food, was wanting during the first days. Water became alike scarce in the interior of the city. The

commotion had rent the pipes of the fountains; the falling in of the earth had choked up the springs that supplied them; and it became necessary, in order to have water, to go down to the river Guayra, which was considerably swelled; and then vessels to convey the water were wanting.

“There remained a duty to be fulfilled toward the dead, enjoined at once by piety, and the dread of infection. It being impossible to inter so many thousand corpses, half-buried under the ruins, commissaries were appointed to burn the bodies: and for this purpose funeral piles were erected between the heaps of ruins. This ceremony lasted several days. Amid so many public calamities, the people devoted themselves to those religious duties, which they thought were most fitted to appease the wrath of heaven. Some, assembling in processions, sang funeral hymns; others, in a state of distraction, confessed themselves aloud in the streets. In this town was now repeated what had been remarked in the province of Quito, after the tremendous earthquake of 1797; a number of marriages were contracted between persons, who had neglected for many years to sanction their union by the sacerdotal benediction. Children found parents, by whom they had never till then been acknowledged; restitutions were promised by persons, who had never been accused of fraud; and families, who had long been enemies, were drawn together by the tie of common calamity. But while in some this feeling seemed to soften the heart, and open it to compassion, it had a contrary effect on others, rendering them more obdurate and inhuman. In great calamities vulgar minds retain still less goodness than strength; for misfortune acts like the pursuit of literature, and the investigation of

nature, which exercise their happy influence only upon a few, giving more warmth to the feelings, more elevation to the mind, and more benevolence to the character."

Shocks so violent as these which, in the space of one minute* overthrew the city of Caraccas, could not, says Humboldt, be confined to a small portion of the continent. Their fatal effects extended to the adjoining districts along the coast, and were more especially experienced in the mountains of the interior, which at the time of Humboldt's visit were thought by the inhabitants to be in a great measure secure from such commotions; the earthquake was felt in New Granada, at a distance of 620 miles; La Guayra, Mayquetia, Antimana, Baruta, La Vega, San Felipe and Merida were almost entirely destroyed. The number of dead at La Guayra and San Felipe exceeded four or five thousand. Yet in the valleys of Aragua, situated between Caraccas and San Felipe the shocks were very weak; and La Victoria, Maracay, and Valencia, scarcely suffered, notwithstanding their proximity to the capital. At Valecillo, not many leagues from Valencia, the ground opened and emitted so large a quantity of water that a new torrent was formed. The same phenomenon took place at Porto Cabello. On the other hand, the Lake of Maracaybo underwent considerable diminution. At Coro no commotion was felt, although the town was situated on the coast between other towns which suffered; and the fishermen who passed the 26th of March in the island of Orchila, 103 miles

* The duration of the earthquake, that is to say, of the whole of the movements of undulation and rising, which occasioned the catastrophe, was estimated by some at fifty seconds, by others, at one minute and twelve seconds.

to the north-east of Caraccas, were not sensible of any shock. Fifteen or eighteen hours after the great catastrophe, the ground remained tranquil. The night was fine and calm, and the commotions did not recommence until after the 27th. They were then attended with a very loud and long continued subterraneous noise. The inhabitants of Caraccas wandered into the neighbouring country; but the villages and farms having suffered as much as the town, they could find no shelter till they were beyond the mountains of Los Tegues in the valleys of Aragua, and the Llanos or savannahs. No less than fifteen oscillations were felt in one day. On the 5th of April there was almost as violent an earthquake as that which overthrew the capital. During several hours the ground was in a state of constant undulation; large masses of earth fell in the mountains; and enormous rocks were detached from the Silla of Caraccas. It was even asserted, and the opinion afterwards prevailed in the country, that the two domes of the Silla sank fifty or sixty toises; but the assertion was not founded on any actual measurement.

On the 30th of April, the inhabitants of Caraccas were terrified by a subterraneous noise which resembled frequent discharges of the largest cannon; and which was likewise heard with alarm at the town of Calabozo, in the midst of the savannahs. The noise began at two o'clock in the morning, and was not accompanied by any shock; and what is remarkable, it was as loud on the coast as at the distance of eighty leagues inland. Everywhere it was believed to be transmitted through the air; and so far was it from being thought a subterraneous noise, that at Caraccas, as well as at Calabozo, preparations were made for putting the

place into a state of defence against an enemy who seemed to be advancing with heavy artillery.

On the same day took place the great eruption of the volcano in the island of St. Vincent, which had not thrown out any lava since the year 1718. The first eruption took place on the 27th of April at noon; it was merely an emission of ashes, but was attended with a tremendous noise. On the 30th, the lava passed the brink of the crater, and after a course of four hours reached the sea. The noise of the explosion resembled that of alternate discharges of very large cannon and of musketry; and "what is well worthy of remark, it seemed much louder at sea, at a great distance from the island, than in sight of land, and near the burning volcano."

CHAPTER VIII.

Departure from Caraccas—Rich vegetation of the valley—Mountains of Higuerota—Valley of the Tuy—Excursion to its gold mine—Enormous trunks of fig-trees—Prosperity of the towns and villages—The Zamang of Guayra—The Hacienda de Cura—The Lake of Valencia—Its cultivated shores—Diminution of its waters—Its islands—Town of New Valencia—Hot springs—Porto Cabello—The Cow-tree.

[1800.]

ON the 7th of February, 1800, our travellers quitted the city of Caraccas on their great expedition to the Orinoco; and in the first instance directed their course to the west, towards the valleys of Aragua and the Lake of Valencia.

Their reason for not taking the direct road to the south was this, that by so doing they would have lost the opportunity of visiting the finest and most cultivated parts of the province, for such the valleys of

Aragua were considered to be, as well as of making some important observations on the Lake of Valencia, and of descending the river Apure to its junction with the Orinoco. Thus the circuitous route by which they penetrated to the interior of the continent had a direction first to the west, then to the south, and finally to the east-south-east.

Setting out from Caraccas in the cool of the evening, they proceeded along its valley, following for some time the right bank of the river Guayra, by an excellent road, partly scooped out of the rock; and soon passed the village of La Vega, where the scattered houses surrounded by date trees seemed to proclaim the easy circumstances of their inhabitants, and the church displayed itself in a picturesque manner on a range of hills covered with vegetation. In the vicinity, all the orchards were full of peach-trees in full flower; this part of the country supplying an abundance of fruits for the market of Caraccas.

Beyond the village of Antimano, the valley narrowed considerably, and the road became fatiguing; between this place and Ajuntas, the travellers crossed the winding stream of the Guayra seventeen times. The river was bordered by a beautiful gramineous plant, rising sometimes to the height of thirty feet; and the huts were surrounded with enormous trees of the alligator pear, whose trunks were covered with a variety of creepers.

Halting at the further end of the valley at the base of the mountains which close it to the south-west, they passed the night at a sugar-plantation where there was a square house filled with negroes. It looked like a barrack; nearly eighty negroes were lying on skins of oxen spread on the ground, four in each apartment. In

the yard were burning a dozen fires, at which the operation of cookery was being carried on. "We were again struck," remarks Humboldt, "with the noisy mirth of the blacks, which almost prevented us from sleeping."

At sunrise on the following morning, the travellers proceeded to cross the mountains of Higuerota, a lofty group which lies between the valleys of Caraccas and Aragua. The country had a wild appearance, and was thickly wooded, the plants belonging to the valley of Caraccas gradually disappearing. The road, however, was so much frequented, that long files of mules and oxen met them at every step. Descending, they came upon a ravine, in which a fine spring was observed gushing from the rock, and forming several cascades. The vegetation was extremely rich and diversified, consisting of tree-ferns, the trunks of which reached the height of twenty-five feet, heliconias, browneas, gigantic figs, palms, and other plants. "The brownea, which the inhabitants call *rosa del monte*, or *palo de cruz*, bears four or five hundred purple flowers together in one thyrsus; each flower has invariably eleven stamina; and this majestic plant, the trunk of which reaches the height of fifty or sixty feet, is becoming rare, because its wood yields a highly valued charcoal."

Having crossed the mountain of Higuerota, our travellers entered at its foot the small village of San Pedro, situated in a basin where several valleys meet. Here, on one spot they found coffee, plantains, and potatoes sedulously cultivated. Soon after leaving the mountain, they entered the valley of the river Tuy, a beautiful and highly cultivated district, covered with hamlets and villages, some of which deserved the name of towns; in a line of twelve leagues they found

four places, La Victoria, San Matheo, Turmero, and Maracay, containing together about 30,000 inhabitants. In this delightful country they passed two days at the plantation of Don Jose de Manterola upon the banks of the Tuy, which winds among grounds covered with plantains, fig-trees, &c., its waters being always cool and clear as crystal. They observed here three species of sugar-cane—the old Creole, the Otaheitan, and the Batavian; the most valuable is the second, which yields a third more of juice than the Creole one, and also furnishes a much larger quantity of fuel.

The house of their entertainer, situated upon a hillock, was surrounded by the cottages of the negroes, to whose humane treatment here as in most of the Spanish colonies, Humboldt bears testimony. In this, as in the other valleys of Aragua, a small spot of ground is allotted to them; they keep poultry, and sometimes even a pig. “Their masters,” says our author, “boast of their happiness, as in the North of Europe the great landholders like to descant upon the ease which the peasants enjoy who are attached to the glebe. The day of our arrival we saw three fugitive negroes brought back; they were slaves newly purchased. I dreaded having to witness one of those punishments which, wherever slavery prevails, destroy all the charm of a country life. Happily these blacks were treated with humanity.”

At the period of our travellers' visit to the valley of the Tuy, workmen were employed in finishing a dike for a canal of irrigation. The undertaking had already cost the proprietor 7000 piastres, besides entailing on him a loss of 4000 more for the cost of a lawsuit in which he had been engaged with his neighbours. While the lawyers were disputing about the

canal, of which only one-half was finished, Don Jose de Manterola began to doubt even the possibility of carrying the plan into execution. To settle the matter, Humboldt took the level of the ground, and found that the drain had actually been constructed eight feet too low. "What sums of money," he exclaims, "have I seen uselessly expended in the Spanish colonies, for undertakings founded on erroneous levelling!"

In the valley of the Tuy, as in most parts of America conquered by the Spaniards, there is a real or fancied gold mine; grains of that metal were, indeed, said to have been picked up in the ravine leading to its assigned locality, and Humboldt was desired to visit it. "An overseer, or *major domo* of a neighbouring plantation, had followed these indications; and after his death, a waistcoat with gold buttons being found among his clothes, this gold, according to the logic of these people, could only have proceeded from a vein, which the falling in of the earth had rendered invisible. In vain I objected, that I could not, by the mere view of the soil, without digging a large trench in the direction of the vein, well judge of the existence of the mine; I was compelled to yield to the desire of my hosts. For twenty years past the major-domo's waistcoat had been the subject of conversation in the country. Gold extracted from the bosom of the earth, is far more alluring in the eyes of the vulgar, than that which is the produce of agricultural industry, favoured by the fertility of the soil, and the mildness of the climate."

Proceeding through a deep ravine named *Quebrada Seca*, which led to the supposed gold mine, the attention of our travellers was attracted by a gigantic tree which had grown on a steep declivity above a house. As apprehensions had been entertained of its injuring

the building, if it should fall, it had been burnt near the root and at the top, and cut so as to sink between some large fig-trees which would impede its further descent. Its length was 160 feet; its diameter at the lower end was eight feet and a half, and at the upper end four feet five inches.

On reaching the appointed spot, the travellers found all traces of the gold mine obliterated, the surface of the ground having been completely changed by the falling down of the earth. They were rewarded, however, for their labour, by an abundant harvest of plants in the thick forest adjoining; the vegetation on every side being of the most magnificent description. The fig-trees displayed a striking phenomenon; woody excrescences rose around them to the height of twenty feet above the ground, and of such a thickness, that in some instances the diameter of their trunks near the roots became nearly twenty-three feet. When these roots are cut with a hatchet at the distance of several feet from the trunk, they throw out a milky juice which quickly becomes altered and coagulated after being deprived of the vital influence of the organs of the tree. "What a wonderful combination of cells and vessels exists in these vegetable masses," exclaims Humboldt, "in these gigantic trees of the torrid zone, which without interruption, perhaps during a thousand years, prepare nutritious food, raise them to the height of 180 feet, convey them down again to the ground, and conceal beneath a rough and hard bark, under the inanimate layers of ligneous matter, all the movements of organized life!"

At sunrise on the 11th, they left the plantation, and proceeded towards Victoria, by a road running along the smiling banks of the Tuy; the morning was cool and

humid, and the air seemed embalmed by the delicious odour of the large liliaceous plants. They passed on the way a farm, where they saw a negress more than a hundred years old; she was seated before a small hut of earth and reeds; and seemed to enjoy very good health. "I hold her to the sun," said her grandson, "the heat keeps her alive." Humboldt remarks, that blacks well-seasoned to the climate, and Indians, are known to attain a happy old age in the torrid zone; and he mentions a native of Peru who died at the age of one hundred and forty-three years, having been married ninety years.

As they approached Victoria, the ground became smoother, resembling the bottom of a desiccated lake. The town itself presented an appearance of great prosperity, containing a population of seven thousand inhabitants, and many fine edifices, among which was a church decorated with Doric columns. Its environs displayed a remarkable phenomenon in agriculture; on a surface nearly 300 toises above the level of the sea, were seen fields of corn mingled with plantations of sugar-canes, coffee, and plantains.

In the villages through which our travellers passed in the valley of Tuy, everything indicated prosperity. From S. Matheo to Turmero, a distance of four leagues, the road led through plantations of sugar, indigo, cotton, and coffee. The regularity of all the villages showed that they owed their origin to monks and missions: the streets were straight and parallel, intersecting at right angles; and in the centre was the church situated in the great square. The relative population of the valleys of Aragua at the time of Humboldt's visit, was equal to that of the most thickly peopled parts of France; the houses were of masonry, and in every

court were cocoa-trees rising above the habitation. The Indians form a portion of the inhabitants, and retain their characteristics in the midst of the civilization which surrounds them. During the short intervals in which they can be prevailed on to work, they are active and laborious; but the temptation of strong liquors is so alluring, that in one week they will spend the earnings of two months, at the small inns which everywhere abound.

“On leaving the village of Turmero,” says Humboldt, “we discover, at the distance of a league, an object which appears on the horizon like a round hillock, or a tumulus covered with vegetation. It is not a hill, however, nor a group of very close trees, but a single tree, the celebrated *Zamang of Guayra*, known over the whole province for the enormous extent of its branches, which form a hemispherical top six hundred and fourteen feet in circumference. The zamang is a beautiful species of mimosa, whose tortuous branches divide by forking. Its slim and delicate foliage is agreeably detached on the blue sky. We rested a long while beneath this vegetable arch. The trunk of the Guayra zamang, which grows on the road from Turmero to Maracay, is not more than sixty-four feet high, and nine and a half feet in diameter; but its real beauty consists in the general form of its top. The branches stretch out like the spokes of a great umbrella, and all incline towards the ground, from which they uniformly remain twelve or fifteen feet distant. The circumference of the branches or foliage is so regular, that I found the different diameters two hundred and five and one hundred and ninety-eight feet. One side of the tree was entirely stripped of leaves from the effect of drought, while on the other both foliage and



South American

Indigo Factory

flowers remained. The branches were covered with creeping plants. The inhabitants of these valleys, and especially the Indians, have a great veneration for the Guayra zamang, which the first conquerors seem to have found nearly in the same state as that in which we now see it. Since it has been attentively observed, no change has been noticed in its size or form. It must at least be as old as the dragon-tree of Orotava. Near Turmero and the Hacienda de Cura, there are other trees of the same species, with larger trunks; but their hemispherical tops do not spread so widely."

At the Hacienda de Cura, which is seated on the borders of the Lake of Valencia, our travellers passed seven days, in a small habitation surrounded by thickets; and here they were agreeably surprised not only at the progress of agriculture, but at the social aspect of the district. Their host Count Tovar, and other great landholders following his example, had begun to let out small farms to poor families who chiefly applied themselves to the cultivation of cotton; the object of this arrangement was to substitute free labour for the compulsory toiling of slaves. "I love," says Humboldt, "to dwell upon these details of colonial industry, because they prove to the inhabitants of Europe, what to the enlightened inhabitants of the colonies has long ceased to be doubtful, that the continent of Spanish America can produce cotton as well as sugar and indigo by free hands, and that the unhappy slaves are capable of becoming peasants, farmers, and land-holders."

The lake of Valencia, or as the Indians call it *Tacarigua*, is remarkable for its picturesque beauties; it is larger than the Lake of Neuchatel, and in its general form bears some resemblance to that of Geneva. Its

northern shores are highly cultivated, presenting numerous plantations of sugar, coffee, and cotton. "Paths bordered with cestrum, azedarach, and other shrubs always in flower, traverse the plain, and join the scattered farms. The ceiba, with large yellow flowers, gives a peculiar character to the landscape, as it unites its branches with those of the purple erythrina. The mixture and brilliancy of the vegetable colours form a contrast to the unvaried tint of a cloudless sky. In the dry season, when the burning soil is covered with a wavy vapour, artificial irrigations keep up its verdure and fecundity. Here and there the granitic rocks pierce the cultivated land, and enormous masses rise abruptly in the midst of the plain, their bare and fissured surfaces affording nourishment to some succulent plants, which prepare a soil for future ages. Often on the summit of these detached hills, a fig-tree or a clusia, with juicy leaves, have fixed their roots in the rock, and overlook the landscape. With their dead and withered branches they seem like signals erected on a steep hill. The form of these eminences reveals the secret of their origin, for when the whole of this valley was filled with water, and the waves beat against the base of the peaks of Mariana, the Devil's Wall, and the coast chain, these rocky hills were shoals or islets."

This lake, when our travellers visited it, was thirty-four miles and a half in length, and four or five in breadth; the mean depth was about eighty-five feet, but in some parts it was upwards of two hundred and fifty feet. For some years previous, attention had been drawn to the curious fact, of the gradual diminution of the waters of this lake; and from a careful examination, Humboldt was convinced that in remote times, they had extended over the whole valley of which it

now only occupies a part. Shells, such as the lake now affords, were found in layers three or four feet thick, nearly as far off as the town of Victoria; and the form of the promontories and their abrupt slope indicated the shores of an Alpine lake. Some persons supposed that there were subterranean channels which carried off the water; Humboldt more rationally attributes the diminution to evaporation, and the clearing of the country. The destruction of the forests and thickets, in the progress of cultivation, has exposed the ground to the direct influence of the sun; the springs and rivers have become less abundant or altogether dried up, and thus the supplies of the lake have been materially diminished.

The lake is embellished with fifteen beautiful islands; the largest of them, Burro, is two miles in length. It was inhabited by some families of Mestizoes, who were occupied in rearing goats, and who seldom visited the neighbouring shore. To these simple men the lake appeared of immense extent; for their subsistence they had plantains, cassava, milk, and a little fish. A hut, constructed of reeds; hammocks woven with the cotton, which the neighbouring fields produced; a large stone on which they made their fire, the ligneous fruit of the tutuma, in which they drew water, constituted their domestic establishment. "The old Mestizo," says Humboldt, "who offered us some of the milk of his goats, had a beautiful daughter; we learned from our guide, that solitude had rendered him as mistrustful as he might, perhaps, have been by the society of men. The day before our arrival, some sportsmen had visited the island; they were surprised by the night, and preferred sleeping in the open air to returning to Mocundo. This news spread alarm throughout the

island. The father obliged the young girl to climb up a very lofty zamang or acacia, which grows in the plain, at some distance from the hut; while he stretched himself at the foot of the tree, and did not permit his daughter to descend, till the sportsmen had departed. Travellers have not always found this timorous watchfulness, this great austerity of manners, among the inhabitants of islands."

On the 21st, the travellers quitted the Hacienda de Cura, continuing their route to the westward, towards the town of Nueva Valencia, seated at the further extremity of the lake. They travelled by night as the heat was excessive in the day-time; and in a thick wood were closely followed for some time by a large jaguar, whose yellings frightened their horses. They were told that this animal had made himself famous in the district, having roamed in the mountains for three years, and escaped the pursuit of the most intrepid hunters. The vegetation was magnificent; at one part the road was bordered by large mimosas, sixty feet high, with horizontal branches meeting, so as to form a verdant canopy, more than fifty yards in breadth.

Resting on the 22nd at the village of Guacara, on the northern shore of the lake, they continued their journey in the evening to New Valencia. This town, which had been founded in 1555, contained a population of six or seven thousand; but it covered a very large extent of ground, the streets being broad and the houses low. Many of the white inhabitants used to abandon their houses, and take up their abode in little plantations of indigo and cotton, where they could "venture to work with their own hands," an effort of industry which would, it seemed, have degraded them in the town. At this place, the *termites*, or white ants,

were very numerous; their excavations were said to resemble subterranean canals, which, filling with water in the rainy season, became extremely dangerous to the buildings of the town.

From Valencia our travellers paid a visit to the hot springs of La Trinchera, ten miles off. The fountains formed a rivulet, which, even in the driest seasons was two feet deep, and eighteen in width; the temperature of the water exceeded 194° , and eggs immersed in it were boiled in less than four minutes. The vegetation around was exceedingly luxuriant, the mimosas and fig-trees pushing their roots into the water, and spreading their branches over it.

From Valencia, also, they made an excursion to the town of Porto Cabello, on the sea-coast, famous for its magnificent harbour. The heat at this place was excessive, and naturally appeared suffocating to persons just descended from the elevated regions of the interior; the temperature, however, was below that of La Guayra; the breeze being stronger and more regular, and the air having more room to circulate between the coast and the mountains. Porto Cabello is one of the three places on this coast at which the yellow fever has been known for a considerable time. Its insalubrity is attributed to the exhalations that rise from the shore to the eastward; the upper part of the harbour is marshy ground covered with stagnant and putrid water.

Returning towards Valencia, they stopped at the farm of Barbula, where they were gratified with a new vegetable phenomenon, interesting to the philosopher and the lover of natural history. They had heard of a tree yielding a juice which resembled milk, and which was used as an article of food by the poor natives; and on visiting it, found the statements made to them on the

subject to be correct. Of this tree very little is known; Humboldt describes it as being peculiar to the Cordilleras of the coast of Caraccas, and occurring most frequently between Barbula and the lake of Maracaybo, and in the valley of Caucagua, three days' journey to the east of Caraccas. In these places it is named the *palo de vaca*, or *arbol de leche*. It forms a fine tree, resembling the broad-leaved star apple of the West Indies. Its oblong pointed leaves, rough and alternate, are marked by lateral ribs, prominent at the lower surface and paralleled; some of them are ten inches long. When an incision is made in the trunk, there issues in abundance a milky fluid, glutinous, tolerably thick, free from all acrimony, and having an agreeable balsamic smell. The Negroes fatten upon it, and the experience of our travellers proves that it produces no noxious effects upon Europeans. They drank considerable quantities of it in the evening before they went to bed, and very early in the morning, without suffering in the slightest degree; its viscosity alone rendered it a little disagreeable. In its chemical character, this juice bears a striking resemblance to the milk of animals. When exposed to the air, a yellowish cheesy substance, called, in fact, cheese by the people, is produced; in five or six days this becomes sour, and it afterwards putrefies. Humboldt supposed the cow-tree to belong to the order of plants called *Sapotea*, to which the *Shea* or *Butter-tree**, mentioned by Mungo

* Park thus describes this plant in the narrative of his First Journey in Africa. "The people were everywhere employed in collecting the fruit of the Shea trees, from which they prepare the vegetable butter mentioned in former parts of this work. These trees grow in great abundance all over this part of Bambarra. They are not planted by the natives, but are found growing naturally in the woods; and in clearing wood-land for cultivation, every tree is cut down but the Shea. The

Park, belongs; but it is now generally regarded as a member of the *Urticaceous* order, and thus as presenting the interesting, though not singular phenomenon of an innocuous and even nutritive plant in a highly poisonous order.

This interesting plant strongly excited the attention of our travellers. "Amid the great number of curious phenomena," says Humboldt, "which have presented themselves to me in the course of my travels, I confess there are few that have so powerfully affected my imagination, as the aspect of the cow-tree. Whatever relates to milk, whatever regards corn, inspires an interest which is not merely that of the physical knowledge of things, but is connected with another order of ideas and sentiments. We can scarcely conceive how the human race could exist without farinaceous substances; and without that nourishing juice, which the breast of the mother contains, and which is appropriated to the long feebleness of the infant. The amylaceous matter of the corn, the object of religious veneration among so many nations, ancient and modern, is diffused in the seeds, and deposited in the roots of vegetables; milk, which serves us as an aliment, appears to us exclusively the produce of animal organization. Such are the impressions we have received in our earliest infancy; such is also the source

tree itself very much resembles the American oak; and the fruit from the kernel of which being first dried in the sun, the butter is prepared by boiling the kernel in water, has somewhat the appearance of a Spanish olive. The kernel is enveloped in a sweet pulp under a thin green rind; and the butter produced from it, besides the advantage of its keeping the whole year without salt, is whiter, firmer, and to my palate of a richer flavour than the best butter I ever tasted made from cow's milk. The growth and preparation of this commodity, seem to be among the first objects of African industry, in this and the neighbouring states; and it constitutes a main article of their inland commerce."

of that astonishment which seizes us at the aspect of the tree just described. It is not here the solemn shades of forests, the majestic course of rivers, the mountains wrapt in eternal frost, that excite our emotion. A few drops of vegetable juice recall to our minds all the powerfulness and fecundity of nature. On the barren flank of a rock grows a tree with coriaceous and dry leaves. Its large woody roots can scarcely penetrate into the stone. For several months of the year not a single shower moistens its foliage. Its branches appear dead and dried, but when the trunk is pierced, there flows from it a sweet and nourishing milk. It is at the rising of the sun, that this vegetable fountain is most abundant. The blacks and natives are then seen hastening from all quarters, furnished with large bowls to receive the milk which grows yellow, and thickens at its surface. Some empty their bowls under the tree itself, others carry the juice home to their children. We seem to see the family of a shepherd, who distributes the milk of his flock.

“I have described,” he continues, “the sensations which the cow-tree awakens in the mind of the traveller at the first view. In examining the physical properties of animal and vegetable products, science displays them as closely linked together; but it strips them of what is marvellous, and perhaps also of a part of their charms, of what excited our astonishment. Nothing appears isolated; the chemical principles that were believed to be peculiar to animals, are found in plants; a common chain links together all organic nature.”



The Red Howling Monkey.

CHAPTER IX.

Departure from the valleys of Aragua—Entrance into the *Llanos*, or plains—Their appearance—Characteristics of the plains of the four great continents; Prairies, Llanos, and Pampas—Want of hills in the Llanos—Two kinds of slight inequalities in them—General outline of the mountains of South America, and of its plains—Traces of ancient inhabitants—Palm-trees of the Llanos.

[1800.]

ON the 6th of March, our travellers departed from the charming valleys of Aragua, to enter upon the desolate plains which stretch far to the south; or, in the words of Humboldt, from a peopled country embellished with cultivation, to plunge into a vast solitude. Proceeding along the south-west side of the Lake of Valencia, they passed over a rich country, covered with plantains and water-melons, and were amused in their route by the singular evolutions of the monkeys, moving in regular bands from tree to tree. The howlings of these creatures announced the rising of the sun: Humboldt ascertained the distance at which their cries are audible to be 1705 yards. According to the Indians, there is one of them who always chants as leader; and the missionaries assert, that, when a young one is on the point of being brought forth, the howlings are suspended until the moment of its appearance.

“Naturalists,” says Humboldt, “have very often described the howling monkeys which live in society in different parts of America. They everywhere resemble each other in their manners, though the species are not always the same. The uniformity with which the araguatoes execute their movements is extremely striking. Whenever branches of the neighbouring

trees do not touch, the male that leads the band suspends himself by the callous and *prehensile* part of his tail; and letting fall the rest of his body, swings himself, till, in one of his oscillations, he reaches the neighbouring branch. The whole file goes through the same evolution at the same place. It is almost superfluous to add, how dubious is the assertion of Ulloa, and so many well-informed travellers, according to whom the marimondoes, the araguatoes, and other monkeys with a prehensile tail, form a sort of chain, in order to reach the opposite side of a river*. We had opportunities of observing thousands of these animals; and for this very reason we place no confidence in accounts, which were, perhaps, invented by the Europeans themselves, though they are repeated by the Indians of the Missions, as if they had been transmitted to them by their own fathers."

On the second day, they began to ascend the mountains which separate the valleys from the *Llanos*, or plains, of the interior, and, reaching the top of an elevated platform, took their last view of the delightful country in which they had spent the previous four weeks. The passage of the mountain range occupied them some days, and, on the 12th, they entered the basin of the *Llanos*, in the ninth degree of north latitude.

"The sun was almost at its zenith; the earth, wherever it appeared sterile and destitute of vegetation, was at the temperature of 118° or 122°. Not a breath of air was felt at the height at which we were on our mules; yet, in the midst of this apparent calm, whirls of dust incessantly arose, driven on by those small cur-

* Ulloa even goes so far as to represent this extraordinary feat of the monkeys in an engraving (in his *Voyage to South America*). .

rents of air, that glide only over the surface of the ground, and are occasioned by the difference of temperature which the naked sand and the spots covered with herbs acquire. These sand-winds augment the suffocating heat of the air. Every grain of quartz, hotter than the surrounding air, radiates heat in every direction; and it is difficult to observe the temperature of the atmosphere, without these particles of sand striking against the bulb of the thermometer. All around us, the plains seemed to ascend toward the sky, and that vast and profound solitude appeared to our eyes like an ocean covered with sea-weeds. According to the unequal mass of vapours diffused through the atmosphere, and the variable decrement in the temperature of the different strata of air, the horizon, in some parts, was clear and distinct; in other parts, it appeared undulating, sinuous, and as if striped. The earth there was confounded with the sky. Through the dry fog, and strata of vapour, the trunks of palm-trees were seen from afar: stripped of their foliage, and their verdant summits, these trunks appeared like the masts of a ship discovered at the horizon.

“There is something awful, but sad and gloomy, in the uniform aspect of these Steppes. Everything seems motionless; scarcely does a small cloud, as it passes across the zenith, and announces the approach of the rainy season, sometimes cast its shadow on the savannah. I know not whether the first aspect of the Llanos excite less astonishment than that of the chain of the Andes. Mountainous countries, whatever may be the absolute elevation of the highest summits, have an analogous physiognomy; but we accustom ourselves with difficulty to the view of the Llanos of Venezuela and Casanare, to that of the *Pampas* of Buenos Ayres and

of Chaco, which recall to mind incessantly, and during journeys of twenty or thirty days, the smooth surface of the ocean."

It has been attempted to characterize the four great divisions of the globe, with reference to their plains, by saying that Europe has its *heaths*, Asia its *steppes*, Africa its *deserts*, and America its *savannahs*. Humboldt observes, however, that erroneous notions are inculcated by this description, inasmuch as no one of the four characteristics is peculiar to any one of the four quarters of the globe. The term heath always implies the existence of the plant of that name; but as all the plains of Europe are not heathy, the description is incorrect. In like manner, the *steppes* of Asia are not always covered with saline plants, some of them being real deserts. The American *llanos* are not always grassy. It is true that deserts, such as those of Africa, are almost wholly wanting in the New World; they exist, however, in the low part of Peru, on the borders of the South Sea, and are called by the Spaniards, not *Llanos*, but *desiertos*.

"This solitary tract is not broad, but four hundred and forty leagues long. The rock pierces everywhere through the quicksands. No drop of rain ever falls on it; and, like the Desert of Sahara, to the north of Tombuetoo, the Peruvian Desert affords, near Huaura, a rich mine of native salt. Everywhere else, in the New World, there are plains, desert because not inhabited, but no real deserts."

The name of *prairies*, given to the *savannahs* of America, is considered by Humboldt as little applicable to pastures that are often very dry, though covered with grass four or five feet in height. The *Llanos* and the *Pampas* of South America, are regarded by him as

real Steppes. "They display," he says, "a beautiful verdure in the rainy season; but, in the season of great drought, assume the aspect of a desert. The grass is then reduced to powder, the earth cracks, the alligator and the great serpents remain buried in the dried mud, till awakened from their long lethargy by the first showers of spring." These phenomena are observed on barren tracts of fifty or sixty leagues in length, wherever the savannahs are not traversed by rivers; for, on the borders of rivulets, and around little pools of stagnant water, the traveller finds at certain distances, even during the period of the great droughts, thickets of the mauritia palm, the leaves of which, spread out like a fan, preserve a brilliant verdure. These immense plains appear, as far as the eye can reach, to adopt our traveller's expression, "like an ocean of verdure." Their extent, however, great as it is, is apt to deceive the traveller. "The uniform landscape of the Llanos; the extreme rarity of inhabitants; the fatigue of travelling beneath a burning sky, and an atmosphere darkened with dust; the view of the horizon, which seems for ever to fly before us; those lowly trunks of palm-trees, which have all the same aspect, and which we despair of reaching, because they are confounded with other trunks that rise by degrees on the visual horizon; all these causes combined, make the steppes appear far greater than they are in reality."

The chief characteristic of these savannahs is the absolute want of sensible hills and inequalities, and the almost perfect level of every part of the soil, which is so remarkable, that often in the space of thirty square leagues there is not an eminence of a foot high. This regularity of surface is said to reign, without interruption, from the mouth of the Orinoco to La Ville de

Araure and Ospinos, under a parallel of a hundred and eighty leagues in length, and from San Carlos to the savannahs of Caqueta, on a meridian of two hundred leagues. There are, however, on the surface of these llanos two kinds of inequalities, which, as Humboldt remarks, will not escape the observation of an attentive traveller. The first is known by the name of *Bancos*, which, he says, are real shoals in the basins of the steppes, fractured strata of sand-stone, or compact limestone, standing four or five feet higher than the rest of the plain, and extending sometimes three or four leagues in length; being entirely smooth, with an horizontal surface, their existence is discovered only by examining their borders. The second species of inequality is known by the name of *Mesa*, and is composed of small flats, or rather, convex eminences, which rise insensibly to the height of a few toises, and are to be recognised only by geological or barometrical levelings, or by the course of rivers. Some of these, inconsiderable as they are, divide the waters between the Orinoco and the northern coast of Terra Firma.

Humboldt has given us a bold geographical outline of South America. He observes, that, in order to have an exact idea of the plains, their configuration and their limits, we must know the chains of mountains that form their boundary. From the great chain of the Andes, then, which bounds, or nearly so, the western side of South America, throughout its whole extent in a north and south direction, branch out three distinct cordilleras, or transverse chains, dividing this continent from east to west. The first, to the northward, is called by our author the *Cordillera of the Coast*, of which the highest summit is the Silla of Caraccas, and which runs across the country in about the tenth parallel of

latitude. The second chain he has named the *Cordillera of Parime*, or of the Great Cataracts of the Orinoco; it extends between the parallels of 3° and 7° from the mouths of the Guaviare and the Meta to the sources of the Orinoco, the Marony, and the Esquibo, towards French and Dutch Guiana. The third chain is the *Cordillera of Chiquitos*, which divides the rivers flowing into the Amazon from those of the Rio de la Plata; and unites, in 16° and 18° of south latitude, the Andes of Peru to the mountains of Brazil. "The small elevation of the great plains, enclosed within these Cordilleras and the Andes, but open to the east, would tempt one to consider them," says our traveller, "as gulfs stretching in the direction of the current of rotation. If, from the effect of some peculiar attraction, the waters of the Atlantic were to rise 50 toises (320 feet) at the mouth of the Orinoco, and 200 toises (1280 feet) at the mouth of the Amazon, the *great tide* would cover more than half of South America. The eastern declivity of the foot of the Andes, now 600 leagues distant from the coast of Brazil, would become a shore beaten by the waves." He might have added, that such a tide would cover the plains of Hindostan, and wash the feet of the Himalaya mountains. After describing the mountains, Humboldt furnishes us with a grand outline of the three plains.

"These three transverse chains, or rather, these three groups of mountains, stretching from west to east, within the limits of the torrid zone, are separated by tracts entirely level,—the *Plains of Caraccas*, or of the Lower Orinoco; the *Plains of the Amazon* and the Rio Negro; and the *Plains of Buenos Ayres*, or of La Plata. I do not use the name of a valley, because the Lower Orinoco and the Amazon, far from flowing in

a valley, form but a little furrow in the midst of a vast plain. The two basins, placed at the extremities of South America, are savannahs, or steppes,—pasturage without trees; the intermediate basin, which receives the equatorial rains during the whole year, is almost entirely one vast forest, in which no other road is known than the rivers. That strength of vegetation which conceals the soil, renders also the uniformity of its level less perceptible; and the *plains* of Caraccas and La Plata alone bear this name. The basins we have just described are called, in the language of the colonists, the *Llanos* of Varinas and of Caraccas, the *bosques*, or *selvas* (forests) of the Amazon, and the *Pampas* of Buenos Ayres. The trees not only, for the most part, cover the plains of the Amazon, from the Cordillera of Chiquitos, as far as that of Parime; they crown also these two chains of mountains, which rarely attain the height of the Pyrenees. On this account, the vast plains of the Amazon, the Madeira, and the Rio Negro, are not so distinctly bounded as the *Llanos* of Caraccas, and the *Pampas* of Buenos Ayres. As the region of forests comprises at once the plains and the mountains, it extends from 18° south to 7° and 8° north, and occupies an extent of nearly a hundred and twenty thousand square leagues. This forest of South America, for in fact there is only one, is six times larger than France.”

The northern plains of Varinas afford some faint traces of the industry of an ancient people that has disappeared, in the shape of a few scattered hillocks, or *tumuli*, called by the Spaniards the *Serillos de los Indios*; and of a causeway of earth, five leagues in length and fifteen feet high, crossing a plain which is frequently overflowed. These were constructed long

before the conquest; and Humboldt seems at a loss to account for their appearance. "Did nations," he asks, "further advanced in civilization, descend from the mountains of Truxillo to the plains of the Apure? The Indians, whom we now find between the Apure and the Meta, are in too rude a state to think of making roads, or raising *tumuli*." Against the theory which some have entertained, that America was originally peopled from Eastern Asia, a powerful argument is derived from the paucity of the lactiferous animals, and the consequent absence of pastoral nations in the New World; because it is scarcely possible to suppose, that any of the pastoral hordes of Tartars (using that name in its popular and more extended signification,) would have emigrated across Behring's Strait, or passed the bridge formed by the Aleutian Islands, without carrying with them a supply of those cattle on which their whole subsistence depended. That America was well suited for the propagation of such animals, is proved by the extraordinary herds of wild cattle and horses which have overrun the plains, from the few originally introduced by the Spaniards.

Over the northern Llanos are scattered several species of the palm-tribe, especially the *palma de cobija*, the wood of which is so hard, that a nail can with difficulty be driven into it. On this account, it is excellent for the purpose of building; and its fan-like leaves afford a thatch for the roofs of the huts, capable of enduring more than twenty years. Another species is known by the name of the *Palma Real de los Llanos*, or Royal Palm of the Plains.

"Other palm-trees rise to the south of Guayaval, especially the piritu with pinnate leaves, and the *murichi* (moriche) celebrated by Father Gumilla under

the name of *arbor de la vida* (or tree of life). It is the sago-tree of America, furnishing '*victum et amictum*,' (food and clothing), flour, wire, and thread to weave hammocks, baskets, nets, and clothing. Its fruit, of the form of the cones of the pine, and covered with scales, perfectly resemble those of the *calamus rotang*. It has somewhat the taste of the apple. When arrived at its maturity it is yellow within and red without. The araguato monkeys eat it with avidity; and the nation of the Guaraunos, whose whole existence, it may be said, is closely linked with that of the murichi palm-tree, draw from it a fermented liquor, slightly acid, and extremely refreshing. This palm-tree, with large shining leaves folded like a fan, preserves a beautiful verdure at the period of the greatest drought. Its sight alone produces an agreeable sensation of coolness, and the *murichi*, loaded with scaly fruit, contrasts singularly with the mournful aspect of the *palma de cobija*, the foliage of which is always gray and covered with dust. The Llaneros believe that the former attracts the vapour in the air; and that for this reason water is constantly found at its foot when dug for to a certain depth. The effect is confounded with the cause. The murichi grows best in moist places; and it may rather be said, that the water attracts the tree. The natives of the Orinoco, by analogous reasoning, pretend that the great serpents contribute to preserve humidity in a canton. 'You would look in vain for water-serpents,' said an old Indian of Javeta to us gravely, 'where there are no marshes, because the water collects no more when you imprudently kill the serpents that attract it.'"



The Fan Palm.

CHAPTER X.

Journey across the Llanos—Fatigue of travelling—Farm of *El Cayman*—Town of Calabozo—An ingenious inhabitant—Gymnoti, or electrical eels—Combat between the eels and horses—Description of the gymnoti—Effects of their shocks—The natives' dread of them—Departure from Calabozo—Heat and dust of the Llanos—An Indian girl found exhausted on the ground—The river Urituco and its crocodiles—Singular story of a crocodile—Arrival at San Fernando—Heat of that place—Periodical inundations, and destruction of horses.

[1800.]

OUR travellers, as we have said, entered the Llanos on the 12th. After passing two nights on horseback, and seeking in vain in the day-time for some shelter from the ardour of the sun beneath the tufts of the *murichi* palm-trees, they arrived just before the third night set in, at a little farm called *El Cayman*, or the Alligator. Here they found a solitary house surrounded by a few small huts covered with reeds and skins; there was no enclosure of any kind, the horses, mules, and oxen rambled where they pleased, and were easily brought together by people appointed for the purpose. These men scour the savannahs on horseback, naked to the waist, and armed with a lance; they are known by the name of *Peones Llaneros*, and are partly slaves and partly free. Their food consists principally of a little meal dried in the air, and sprinkled with salt.

At this farm they found an old negro slave, who had the management of it during his master's absence; and he told them of herds composed of several thousand cows, under his care. Yet they asked in vain for a bowl of milk; and were obliged to content themselves with some fetid water, which they obtained from a neighbouring pool, and which, at the recommendation

of the negro, they drank through a piece of linen cloth, that they might not be incommoded by its smell, or obliged to swallow the fine yellowish clay which it held suspended. The mules being unloaded, were set at liberty and allowed to go in search of water; our travellers followed them, and soon came upon a copious reservoir, surrounded with palm-trees. Bathing had for some time been a necessary recreation with them; and after a toilsome journey across the hot sandy Llanos, they plunged with avidity into the tempting pool. Scarcely had they began to enjoy the refreshing coolness of the water, when they heard an alligator floundering in the mud, and of course made a precipitate retreat. Night came on, and they set out on their return to the farm, but were quite unable to find it. Just as they had resolved to seat themselves under a palm-tree, in a dry spot surrounded by short grass, an Indian who had been round collecting the cattle, came up, and was with some difficulty prevailed upon to conduct them to the house.

At two o'clock on the following morning they set out toward Calabozo, and on their way suffered greatly from the excessive heat of the sun. Whenever the wind blew, the temperature rose to 104° or 106° , and the air was loaded with dust. Their guides advised them to fill their hats with leaves of the *rhopala* plant, in order to prevent the action of the solar rays upon the head; and from this expedient our travellers derived considerable advantage.

Calabozo is described as a flourishing little town in the midst of the Llanos, with a population of five thousand souls. The wealth of the inhabitants consists principally of cattle, of which there were said to be ninety-eight thousand in the neighbouring pastures.

It is computed by Depons, the author of a work on Colombia, that in the northern plains, stretching from east to west, between the mouth of the Orinoco and the Lake of Maracaybo, there are 1,200,000 oxen, 180,000 horses, and 90,000 mules; and Humboldt observes, on the authority of a Spanish writer (Azara), that in the Pampas of Buenos Ayres, there are believed to exist 12,000,000 cows, and 3,000,000 horses, without comprising in this enumeration, the cattle which have no acknowledged owner. In the Llanos of Caraccas, the rich *hateros*, or proprietors of cattle farms, or *hatos*, are entirely ignorant of the number of cattle which they possess; the young are branded with a mark peculiar to each herd, and some of the most wealthy owners mark as many as 14,000 every year, and sell 5,000 or 6,000.

At Calabozo, our travellers met with an ingenious inhabitant, named Carlos del Pozo, who had constructed an electrical machine with large plates, electrophori, batteries, and electrometers, forming an apparatus nearly as complete as scientific men in Europe possessed. Yet this individual had never seen any such instrument, or received any instructions from other persons; having been guided alone by the information which he had derived from Sigand de la Fond's treatise, and Franklin's Memoirs. He was delighted at meeting with two such men of science as Humboldt and Bonpland, who showed him the effect, then newly discovered, of the contact of different metals on the nerves of frogs; and thus, "for the first time, the names of Galvani and Volta resounded in those vast solitudes."

Ever since his first arrival in South America, Humboldt had been eager in his search after the *gymnoti*,

or electrical eels, which were known to exist in the pools of stagnant water, and the confluent of the Orinoco. He wished to procure some of these animals at Calabozo, but the dread of them is so great among the Indians and common people, that the offer of reward was unavailing, though it was pretended that by taking the precaution of chewing a little tobacco, they might be touched with impunity. Humboldt observes, that this fable of the influence of tobacco, on animal electricity, is as general on the continent of South America, as the belief among mariners of the effect of garlic and tallow on the magnetic needle. As the single specimen which after some time was brought to them afforded very unsatisfactory results, our travellers set out themselves in search of others on the 19th, and were conducted to a stream, which in the season of drought forms a pool of muddy water, surrounded by fine trees. It is difficult to catch the gymnoti with nets, on account of their extreme agility and their burying themselves in the mud like serpents; but they may be taken by the aid of the roots of certain plants, which, when thrown into the water, intoxicate or benumb them. Our travellers were about to procure some by this latter method, when the Indians told them that they would *embarbascar con cavallos*, set the fish to sleep, or intoxicate them with horses. It was difficult to conceive what this meant; but in a short time the guides, who had gone out into the plain, returned with about thirty horses and mules, which they forthwith drove into the pool. A singular scene then ensued.

“The extraordinary noise caused by the horses’ hoofs, makes the fish issue from the mud, and excites them to combat. These yellowish and livid eels, resem-

bling large aquatic serpents, swim on the surface of the water, and crowd under the bellies of the horses and mules. A contest between animals of so different an organization, furnishes a very striking spectacle. The Indians, provided with harpoons and long slender reeds, surround the pool closely; and some climb upon the trees, the branches of which extend horizontally over the surface of the water. By their wild cries, and the length of their reeds, they prevent the horses from running away, and reaching the bank of the pool: the eels, stunned by the noise, defend themselves by the repeated discharge of their electric batteries. During a long time they seem to prove victorious. Several horses sink beneath the violence of the invisible strokes which they receive from all sides, in organs the most essential to life, and stunned by the force and frequency of the shocks, disappear under the water. Others panting, with mane erect, and haggard eyes, expressing anguish, raise themselves, and endeavour to flee from the storm by which they are overtaken. They are driven back by the Indians into the middle of the water; but a small number succeed in eluding the active vigilance of the fishermen. These regain the shore, stumbling at every step, and stretch themselves on the sand, exhausted with fatigue, and their limbs benumbed by the electric shocks of the gymnoti.

“In less than five minutes, two horses were drowned. The eel, being five feet long, and pressing itself against the belly of the horse, makes a discharge along the whole extent of its electric organ. It attacks at once the heart, the intestines, and the *plexus coeliacus* of the abdominal nerves. It is natural that the effect felt by the horses should be more powerful than that produced upon man, by the touch of the same fish, at only

one of his extremities. The horses are probably not killed, but only stunned. They are drowned by the impossibility of arising amid the prolonged struggle between the other horses and the eels.

"We had little doubt that the fishing would terminate by killing successively all the animals engaged; but by degrees the impetuosity of this unequal combat diminished, and the wearied gymnoti dispersed. They require a long rest, and abundant nourishment, to repair what they have lost of galvanic force. The mules and horses appear less frightened; their manes are no longer bristled; and their eyes express less dread. The gymnoti approach timidly the edge of the marsh, where they are taken by means of small harpoons fastened to long cords. When the cords are very dry, the Indians feel no shock in raising the fish into the air. In a few minutes we had five large eels, the greater part of which were but slightly wounded."

A few more were taken by the same means towards evening; and thus there were a sufficient number of specimens on which to make experiments. Some of those measured, were from five feet four inches, to five feet seven inches in length. The weight of one, four feet one inch long, was fifteen pounds and three-quarters troy, and its transverse diameter exceeded three inches and a half. The colour was a fine olive-green; the under part of the head being yellow, mingled with red. The swimming-bladder is of large size, and resting upon the electric organs, which occupy more than two-thirds of the fish.

It would be an act of temerity, we are told, to expose one's self to the first shocks of a large and strongly irritated gymnotus,—the stroke from such a fish being productive of a very violent pain and numbness, ex-

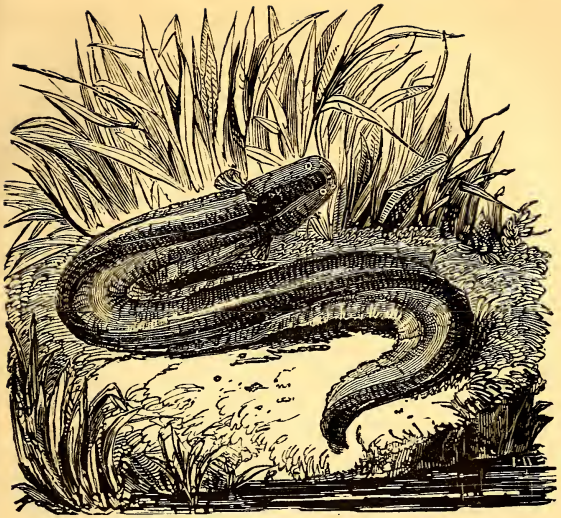
ceeding that which results from the discharge of a Leyden jar. Humboldt received so dreadful a shock by imprudently placing his feet on one just taken out of the water, that he was affected during the rest of the day with a violent pain in the knees, and in almost every joint. If a weak and exhausted one be touched, a twitching sensation is felt, which is communicated from the hand to the elbow; a kind of internal vibration ensues for two or three seconds, and is then followed by a painful torpidity. The electric action of the fish depends entirely on its will, and it has the power of directing the energy of its organs to any particular part of the external object affecting it. The same substances which transmit or intercept the electric action of a conductor charged by a Leyden jar or a Voltaic pile, transmit or intercept the action of the gymnotus upon man; and in the water the shock can be conveyed to a considerable distance. There has never been any spark observed to issue from the body of the eel when excited.

The gymnoti are objects of dread to the natives, and their presence is considered as the principal cause of the want of fish in the ponds and pools of the Llanos. "The gymnoti kill many more than they devour; and the Indians told us, that when they take young alligators and gymnoti at the same time in very strong nets, the latter never display the slightest trace of a wound, because they disable the young alligators before they are attacked by them. All the inhabitants of the waters dread the society of the gymnoti. Lizards, tortoises, and frogs seek the pools, where they are secure from their action. It became necessary to change the direction of a road near Urituco, because these electrical eels were so numerous in one river, that

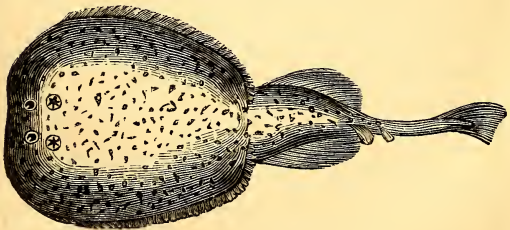
they every year killed a great number of mules of burden as they forded the water*."

On the 24th of March, the travellers left Calabozo, and advanced into the southern part of the Llanos. As they proceeded, they found the ground more dusty, more destitute of herbage; and more cracked by the effect of long drought. The palm-trees disappeared by degrees. The thermometer kept, from eleven in the morning till sunset, at 93° or 95°. "The more," says Humboldt, "the air appeared calm at eight or ten feet high, the more we were enveloped in those whirlwinds of dust caused by the little currents of air that sweep the ground. About four o'clock in the afternoon, we found a young Indian girl stretched upon the savannah. She was quite naked, lay upon her back, and appeared to be only twelve or thirteen years of age. Exhausted with fatigue and thirst, her eyes, nostrils, and mouth filled with dust, she breathed with a rattling in her throat, and was unable to answer our questions. A pitcher overturned, and half filled with sand, was lying at her side. Happily one of our mules was laden with water; and we roused the young girl from her lethargic state by washing her face, and forcing her to drink a few drops of wine. She was at first frightened at seeing herself surrounded by so many persons; but by degrees she took courage, and conversed with our guides. She judged from the position of the sun that she must have remained during several hours in that state of lethargy." She could not be prevailed upon to mount one of the beasts of burden, or to return to Urituco; she was therefore furnished with some water,

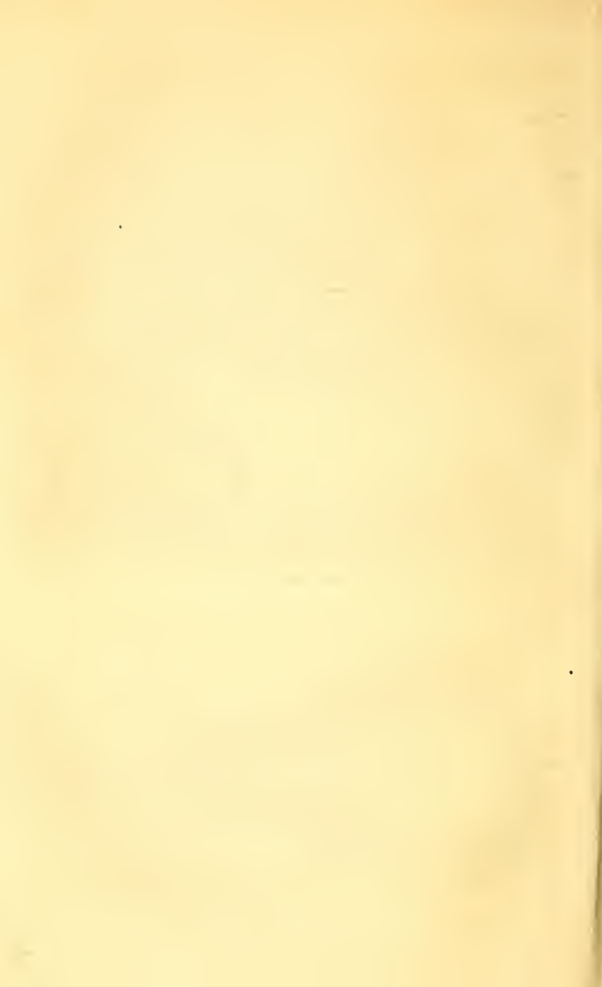
* We have given on the opposite page a representation of the *Gymnotus*; and at the same time, one of another electrical animal called the *Torpedo*, which is a flat fish, found on various coasts of Europe, and measuring, when full grown, about twenty inches in length.



The Gymnotus Electricus.



The Torpedo.



and resuming her way, was soon separated from her preservers by a cloud of dust.

In the night the travellers forded the Rio Urituco, which is infested with a breed of crocodiles remarkable for their ferocity, although those in a neighbouring stream are not at all dangerous. They were advised to prevent their dogs from going to drink in the rivers, as it often happened that the crocodiles came out of the water and pursued dogs on the banks. "The manners of animals," observes Humboldt, "vary in the same species, according to local circumstances, difficult to investigate. We were shown a hut, or rather a kind of shed, in which our host of Calabozo, Don Miguel Cousin, had witnessed a very extraordinary scene. Sleeping with one of his friends on a bench covered with leather, Don Miguel was awakened early in the morning by violent shakes and a horrible noise. Clods of earth were thrown into the middle of the hut. Presently a young crocodile, two or three feet long, issued from under the bed, darted at a dog that lay on the threshold of the door, and missing him in the impetuosity of his spring, ran toward the beach to attain the river. On examining the spot where the *barbacon*, or bedstead, was placed, the cause of this strange adventure was easily discovered. The ground was disturbed to a considerable depth. It was dried mud that had covered the crocodile in that state of lethargy, or *summer sleep*, in which many of the species lie during the absence of rains amid the Llanos. The noise of men and horses, perhaps the smell of the dog, had awakened the crocodile. The hut being placed at the edge of the pool, and inundated during part of the year, the crocodile had no doubt entered, at the time of the inundations of the savannahs, by the same opening

by which M. Pozo saw it go out." Enormous boas or water-serpents are often found by the Indians in the same lethargic state.

On the 25th of March, the travellers crossed the smoothest part of the plains of Caraccas, the *Mesa de Pavones*, on which not a single object fifteen inches high could be discovered, with the exception of the cattle which they met in large herds. On the 27th they reached the Villa de San Fernando, on the river Apure, where their journey across the Llanos ended.

The town of San Fernando, the capital of the missions of the Capuchins, in the province of Varinas, was founded in 1789, or little more than ten years before the visit of our travellers. It is advantageously situated on the Apure (a tributary of the Orinoco), near the mouth of another stream which traverses the whole of Varinas; and thus all the productions of the province pass through it on their way to the coast. The place is remarkable for the excessive heat which prevails there during the greater part of the year. The temperature of the white sand on the shores, when exposed to the sun, was $106\frac{1}{2}^{\circ}$ at two o'clock in the afternoon; eighteen inches above the sand the thermometer stood at 109° , and at six feet above it, nearly 102° . In the shade it was at 97° . Yet high as these temperatures were, an increase of five degrees ensued when the wind began to blow.

The Apure, like other streams in South America, swells during the rainy season, so as to overflow its banks, and inundate a vast extent of the adjoining level. At this period the savannahs are covered with water twelve or fourteen feet deep; the country presents the appearance of a vast lake, with the scattered villages and farm-houses rising in it on islands scarcely

elevated above its surface. Commerce is then very active; the inhabitants cross the flats in their boats, instead of ascending the rivers, and by so doing avoid the strong currents, and escape the danger to which the trees carried down the streams would expose them. Great numbers of horses, mules, and cows perish before they have time to reach the higher grounds; and their carcasses furnish an abundant repast to the *zamuros*,¹ or carrion vultures, which have "the name of *Pharaoh's chickens*, and render the same service to the inhabitants of the Llanos, as the vultur percnopterus to the inhabitants of Egypt." The mares, followed by their colts, may be seen swimming about and feeding on the grass, the top of which alone rises above the water. In this state they are pursued by the crocodiles, and those which are fortunate enough to escape destruction often bear the prints of the teeth of these carnivorous reptiles*.

* Dr. Southey, in his *History of Brazil*, relates an extremely interesting anecdote, which may be here introduced from its reference to the swelling of the South American rivers. In the sixteenth century, when the Jesuit missionaries, despising toil and danger, penetrated into Paraguay for the conversion of the Indians, Ortega, one of the most active, was in the habit of making long journeys among the native tribes, accompanied by a few converts. "In one of these excursions Ortega was caught by a sudden flood between two rivers; both overflowed, and presently the whole plain had the appearance of one boundless lake. The missionary, and the party of neophytes who accompanied him, were used to inconveniences of this kind, and thought to escape as heretofore, with marching mid-deep in water; but the waters continued to rise, and compelled them to take to the trees for safety. The storm increased, the rain continued, and the inundation augmented; and, among the beasts and reptiles whom the waters had surprised, one of the huge American serpents approached the tree upon which Ortega and his catechist had taken refuge, and, coiling round one of the branches, began to ascend, while they fully expected to be devoured, having neither means of escape nor of defence; the branch by which he sought to lift himself broke under his weight, and the monster swam off. But though they were thus delivered from this danger, their situation was

"We cannot reflect," says Humboldt, "on the effects of these inundations, without admiring the prodigious pliability of the organization of the animals that man has subjected to his sway. In Greenland the dog eats the refuse of the fisheries; and, when fish are wanting, feeds on sea-weed. The ass, and the horse, originally natives of the cold and barren plains of Upper Asia, follow man to the New World, return to the savage state, and lead a restless and painful life in the burning climate of the tropics. Pressed alternately by excess of drought and of humidity, they sometimes seek a pool in the midst of a bare and a dusty soil, to quench their thirst; and at other times flee from water, and the overflowing rivers, as menaced by an enemy that threatens them on all sides. Harassed during the day by gad-flies and moschettoes, the horses, mules and cows find themselves attacked at night by enormous bats, that fasten on their backs, and cause wounds that become dangerous, because they are filled with ascaridæ, and other hurtful insects. In the time of great drought, the mules gnaw even the thorny melocactus, (melon thistle,) in order to drink its cooling juice, and draw it forth as from a

truly dreadful; two days passed, and, in the middle of the second night, one of the Indians came swimming towards the tree by the lightning's light, and called to Ortega, telling him that six of his companions were at the point of death; they who had not yet been baptized entreated him to baptize them; and those who had received that sacrament, requested absolution ere they died. The Jesuit fastened his catechist to the bough by which he held, then let himself down into the water, and swam to perform these offices; he had scarcely completed them before five of these six people dropped and sunk; and, when he got back to his own tree the water had reached the neck of his catechist, whom he had now to untie, and help him to gain a higher branch. The flood, however, now began to abate. Ortega, in swimming among the thorny boughs, received a wound in his leg, which was never thoroughly healed, during the two-and-twenty years that he survived this dreadful adventure."

vegetable fountain. During the great inundations, thesesame animals lead an amphibious life, surrounded by crocodiles, water-serpents, and manatees. Yet, such are the immutable laws of nature, their races are preserved in the struggle with the elements, and amid so many sufferings and dangers. When the waters retire, and the rivers return again into their beds, the savannah is spread over with a fine odoriferous grass: and the animals of Europe and Upper Asia seem to enjoy, as in their native climate, the renewed vegetation of spring."

CHAPTER XI.

Preparations for the voyage down the Apure—The tribe of the Yaruroes—Wild animals on the banks of the river—The vegetation—Crocodiles—Story of an Indian girl seized by one—Chiguïres—An enormous jaguar—Senor Don Ignacio, the jaguar hunter—Incidents of a night—Nocturnal noises in the forests—The Caribe fish—Humboldt's adventure with a jaguar—Manatees—Juncture of the Apure and Orinoco.

OUR travellers having taken a short rest at San Fernando, proceeded on their way to the Orinoco. There was a land route from the town thither, and an obliging offer to conduct them over it was made by an old farmer, bearing the name of Don Francisco Sanchez, whose dress, as Humboldt remarks, denoted the great simplicity of manners prevailing in these distant regions. He had acquired a fortune of 100,000 piastres, yet he mounted his horse bare-legged and barefooted, though armed with large silver spurs. His offer, however, was not accepted; the rainy season had already begun, and the land route lay across an unhealthy and uninteresting flat. The travellers there-

fore preferred the longer route down the Apure, and accordingly hired a large canoe, or *laucha*, as the Spaniards call it, managed by a pilot and four Indians. In the stern was constructed a sort of cabin, covered with the leaves of the corypha; and a table and benches were formed of some ox-hides stretched on frames of Brazil wood. A stock of provisions, sufficient for the consumption of a month, was laid in; the river itself abounds in fish, manatees, and turtle; and its banks are frequented by numberless birds, of which the most useful to man are the *pauxi* and *guacharaca*, the turkeys and pheasants, as it were, of those countries. The missionary with whom they had lodged, supplied them with wine, oranges, and tamarinds; and their store was completed by the addition of some fishing instruments, fire-arms, and casks of brandy, for bartering with the natives.

They embarked on the afternoon of the 30th of March. Passing the mouth of the river Apurito, they passed along the island of the same name, formed between the Apure and Guarico, and extending seventy-six miles in length. On the left bank of the Apure, they saw the huts of the Yaruroes, a tribe who live by hunting and fishing, and chiefly supply the jaguar skins which find their way into the European markets as those of the tiger. Humboldt remarked in them some of the characteristics of the Mongols, a stern look, an elongated eye, and high cheek-bones; the nose, however, was prominent throughout its whole length. The night was passed at a small sugar-plantation, called *Diamante*; and a contrary wind detained the travellers on shore till noon of the following day.

Leaving *Diamante*, they entered a district inhabited only by tigers, crocodiles, and *chiquires*, a large species

of the guinea-pig; flights of birds were seen so closely crowded together, as to resemble a dark cloud. The river gradually widened, one bank being generally sandy and bare, the other higher and covered with tall trees. Sometimes it was bordered with forests on both sides, and appeared like a straight canal, 960 feet in breadth. The vegetation was singularly disposed: along the margins were bushes of *sauso*, looking as if they had been clipped by the hand of man, and forming a kind of hedge four feet high, in which openings had been made by jaguars, tapirs, and pecaris, to reach the water and drink. These animals were not alarmed at the approach of the boat, and the travellers had ample time to view them as they slowly walked on the shore and retreated into the forest. Behind the *sauso* hedge, copses of cedars, brazillettoes, and lignum-vitæ, reared their heads, with here and there a palm-tree, and a few scattered trunks of the thorny piritu and corozo. In this scene of untamed and savage nature, the traveller at one moment is delighted with the sight of the jaguar, the beautiful panther of America; at another, with the peacock, pheasant, or cashew bird, with its black plumage and its tufted head, moving slowly along the *sauzos*. Gliding down the stream, animals of the most different classes succeed each other. "It is just as it was in Paradise," said the old Indian pilot of the missions to our travellers; and Humboldt observes, that "everything indeed here recalls to mind that state of the primitive world, the innocence and felicity of which, ancient and venerable traditions have transmitted to all nations; but in carefully observing the manners of animals among themselves, we see that they punctually avoid each other. The golden age has ceased, and in this paradise of American forests, as

well as everywhere else, sad and long experience has taught all beings that benignity is seldom found in alliance with strength."

Where the *sauso* hedge did not approach close to the stream, parties of eight or ten crocodiles were often seen stretched on the sand, reposing motionless on the sand, with their jaws open at right angles. So numerous were these monstrous reptiles, that along the whole course of the river there were usually five or six in view at the same time; yet, the swelling of the river having scarcely begun, there must have been many more buried in the dried mud of the savannahs. The length of one found dead was seventeen feet nine inches; another measured twenty-three feet. The species is that of the real crocodile, such as is found in the Nile, and not that of the cayman or alligator which is more commonly found in the New World,—to which indeed it is peculiar. Our travellers were informed by their guides that at San Fernando scarcely a year passed in which several persons, especially females, were not drowned by these crocodiles.

"They related to us," says Humboldt, "the history of a young girl of Uritucu, who, by singular intrepidity and presence of mind, saved herself from the jaws of a crocodile. When she felt herself seized, she sought the eyes of the animal, and plunged her fingers into them with such violence, that the pain forced the crocodile to let her loose, after having bitten off the lower part of her left arm. The girl, notwithstanding the enormous quantity of blood she had lost, happily reached the shore, swimming with the hand she had still left. In those desert countries where man is ever wrestling with nature, discourse daily turns on the means that may be employed to escape from a tiger, a boa or *traga venado*,

Alligator destroying a Snake.



or a crocodile; every one prepares himself in some sort for the dangers that await him. 'I knew,' said the young girl of Uritucu coolly, 'that the *cayman* lets go his hold, if you push your fingers in his eyes.' Long after my return to Europe, I learned that, in the interior of Africa, the negroes know and practise the same means. Who does not recollect, with a lively interest, Isaaco, the guide of the unfortunate Mungo Park, seized twice, near Boolinkoomboo, by a crocodile, and twice escaping from the jaws of the monster, having succeeded in placing his fingers under water in both his eyes*? The African Isaaco, and the young American, owed their safety to the same presence of mind, and the same combination of ideas." Yet this expedient is not always attended with success.

* The incident referred to occurred in crossing the river Wonda, one of the affluents of the Senegal, and is thus related in Park's Journal. "There being but one canoe, it was near noon before all the bundles were carried over. The transporting of the asses was very difficult, the river being shallow and rocky; wherever their feet touched the bottom, they generally stood still. Our guide, Isaaco, was very active in pushing the asses into the water, and shoving along the canoe; but as he was afraid that we could not have them all carried over in the course of the day, he attempted to drive six of the asses across the river further down, where the water was shallower. When he had reached the middle of the river, a crocodile rose close to him, and instantly seizing him by the left thigh, pulled him under water. With wonderful presence of mind, he felt for the head of the animal, and thrust his finger into its eye; on which it quitted its hold, and Isaaco attempted to reach the further shore, calling out for a knife. But the crocodile returned and seized him by the other thigh, and again pulled him under water. He had recourse to the same expedient, and thrust his fingers into its eyes with such violence, that it again quitted him, and when it rose, flounced about on the surface of the water, as if stupid, and then swam down the middle of the river. Isaaco proceeded to the other side, bleeding very much. As soon as the canoe returned, I went over, and found him very much lacerated. The wound on the left thigh was four inches in length; that on the right not quite so large, but very deep; besides several single teeth wounds on his back."

These animals move slowly when not excited, but in attacking any object, their motions are abrupt and rapid. In running, they make a rustling noise, which is apparently caused by the scales; they bend the back and seem to be higher than when at rest. Though they generally advance in a straight line, they can easily turn when they please; and they swim with great facility, even against the most rapid current. Their chief food in the Apure seemed to be the unhappy chiguire, who, having no weapons of defence, fall a prey to the jaguars on land, and the crocodiles in the water. In a sinuosity, called the *Vuelta del Joval*, the canoe was surrounded by these creatures, swimming like dogs, with the head and neck out of the water. These animals were seen, too, in herds on the banks; they displayed no fear on the approach of man, but the sight of a dog put them to flight, though they ran so slowly that two of them were caught. Their flesh has the smell of musk; but the monks, it is said, do not scruple to eat the hams which are made of it, as they place it, in their zoological classification, in the same class with the armadillo, and the manatee, near the tortoise, which last they place next to the fish family.

About the *Vuelta del Joval* everything assumed a wild and awful character. A large crocodile, sleeping on the shore in the midst of a group of these animals, awoke when the canoe approached, and moved slowly into the stream, without disturbing its companions. Here, too, an enormous jaguar was seen, stretched beneath the shade of a large zamang or mimosa; it surpassed in size all the tigers which Humboldt had seen in the collections of Europe. In its paw it held a chiguire, which it had just killed; around it were flocks of zamuro vultures, waiting to devour the remains

of the repast. The mixture of boldness and timidity which these birds displayed was curious; every now and then they advanced within a few feet of the jaguar, but, at the slightest movement which he made, they instantly retreated. With the view of examining more closely the manners of these animals, our travellers got into their little boat; but the noise of the oars disturbed the jaguar, and he retired slowly behind the sauso bushes. The vultures, profiting by his absence, pounced upon his victim; but the watchful monster suddenly leapt into the midst of them, and, seizing upon the carcass, carried it off.

Near this place, they passed the night, as usual, in the open air, in the plantation of which, the proprietor was engaged in the occupation of hunting jaguars. This amusing individual, *Senor Don Ignacio* by name, was nearly naked, and had a complexion as brown as that of a zambo; yet he considered himself to be a white, and prided himself on being of the European race. His wife and daughter *Donna* Isabella and *Donna* Manuela, were as lightly clothed as himself. Proud as he was of his nobility, and the colour of his skin, Señor Don Ignacio had not taken the trouble to construct even a hut of palm leaves; but was content to sling his hammock between two trees. At his polite invitation, our travellers provided similar accommodation for themselves in his vicinity. In the course of the night, a thunder-storm came on, and wetted them to the skin; and Donna Isabella's cat, which had taken up its lodging in a tamarind-tree, fell into the hut of one of the strangers, who conceiving himself to be attacked by a wild beast, raised a terrible outcry, which sadly discomposed the rest of the party. The rain fell in torrents all the rest of the night; and in the morning, the

drenched and shivering travellers were congratulated by their complacent host, upon their good fortune in sleeping among whites and persons of rank, instead of reposing on the strand. Don Ignacio prided himself on the valour which he had displayed against the Indians, and the services which he had rendered to God and the king, in carrying off children from their parents to be distributed among the missions. "What a singular spectacle," exclaims Humboldt, "to find in that vast solitude a man who believes himself of European race, and knows no other shelter but the shade of a tree, with all the vain pretensions, all the hereditary prejudices, all the errors of long civilization!"

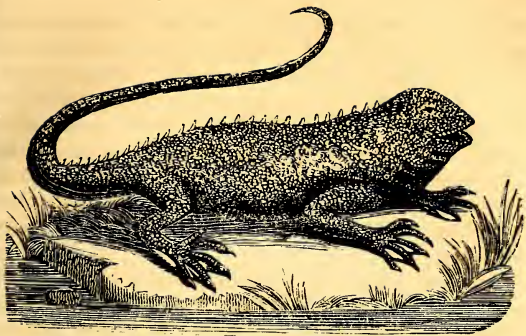
Quitting their amusing host at sunrise on the following morning, our travellers glided down the river, with vast forests on either hand. They passed a low island, crowded with flamingoes, roseate spoonbills, herons, and water-hens, which presented a great diversity of colours. On the right bank, they saw a small Indian mission, where a tribe of Guamos dwelt in a few huts of palm leaves. The night, beautiful and moonlight, was spent upon the margin of the river on a bare and extensive beach; as there were no trees on the banks, they stuck the oars in the ground, and suspended their hammocks between them. Great difficulty was experienced in procuring dry wood for the fires, which were needed to keep off the wild beasts, the forests being quite impenetrable. Towards midnight there arose, in the wood, a terrific and appalling noise, which banished sleep; it proceeded from the wild beasts, who, the Indians said, were keeping the feast of the full moon. Amid the clamour, the Indians could distinguish the soft cries of the sapajous, the moans of the alouates, (species of monkeys,) the

howlings of the jaguars, of the couguars, (or American lions,) of the pecaris and the sloths, and the voices of the curassows, the parraquas, and other gallinaceous birds. When the tigers approached the edge of the forest, a dog, which the travellers had with them, began to howl and seek refuge under the hammocks. Occasionally, a long silence ensued, and again the cries of the animals came from the tops of the trees, and were followed by the long and sharp whistling of the monkeys.

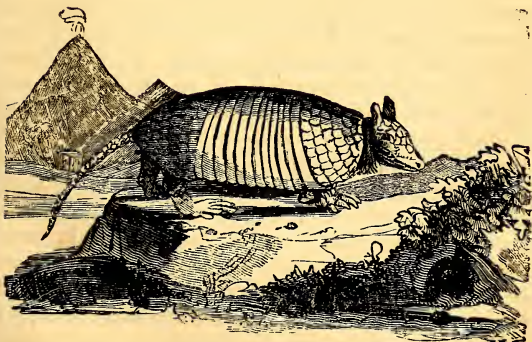
Our travellers became afterwards better accustomed to these nocturnal scenes; during the course of whole months, they heard the same noises repeated, whenever the forest approached the bed of the rivers. The security displayed by the Indians, inspires travellers with confidence. "You persuade yourself, with them, that the tigers are afraid of fire, and do not attack a man lying in his hammock." These attacks are, in fact, extremely rare, and, during his abode in South America, Humboldt remembers only one example,—the case of a Llanero, who was found torn in his hammock, opposite the island of Achaguas. He considers this agitation in the forests to be the effect of some contest that has arisen in the depths of the forests. "The jaguars, for instance, pursue the pecaris, and the tapirs, which having no defence but in their numbers, flee in close troops, and break down the bushes they find in their way. Affrighted at this struggle, the timid and mistrustful monkeys answer, from the tops of the trees, the cries of the large animals; they awaken the birds that live in society, and, by degrees, the whole assemblage is in movement. It is not always in a fine moonlight, but, more particularly, at the time of a storm and violent showers, that this tumult takes place among the wild beasts. 'May Heaven grant to them a

quiet night and repose, and to us also !' said the monk, who accompanied us to the Rio Negro, when, sinking with fatigue, he assisted in arranging our accommodation for the night. It was, indeed, a strange situation to find no silence in the solitude of woods. In the inns of Spain, we dread the sharp sound of guitars from the next apartment; in those of the Orinoco, which are an open beach, or the shelter of a solitary tree, we are afraid of being disturbed in our sleep by voices from the forest."

Starting before sunrise, they continued to descend the river, the stream of which was crowded by porpoises, and its banks with aquatic birds. The navigation was rather dangerous, on account of the large trees which remained obliquely fixed in the mud, like the *snags*, as they are called, which so often injure the steam-boats in the rivers of North America. Landing near the *Vuelta del Basilio* to gather plants, they saw on a tree two beautiful jet-black monkeys of an unknown species; and the Indians pointed out a nest of *iguanas*, a species of lizard, of which the flesh is very white, and, next to that of the armadillo, is the best food to be found in the huts of the natives. Again passing the night on the beach, they resumed their solitary voyage; and, on their way, caught the fish known by the name of the *caribe* or *caribito*, from its delight in blood. This little animal is only four or five inches in length, yet it attacks persons who go into the water, and, with its sharp triangular teeth, often tears away large pieces of their flesh. It is the dread of the Indians, several of whom showed the scars of deep wounds in the calf of the leg and thigh made by this animal. These fishes live at the bottom of rivers; but, if a few drops of blood be shed in the water, they arrive by thousands at the surface. No one ven-



Iguana, or Eatable Lizard.



Twelve-banded Armadillo, (*Dasypus tatouay*.)



tures to bathe where the caribe is found; and thus it becomes as great a scourge in the water, as the moschettoes in the air.

The party landed at noon in a desert spot, where Humboldt went away from his companions, and walked along the beach, in order to observe a group of crocodiles sleeping in the sun. Suddenly he perceived the recent footmarks of a beast of prey, and turning his eyes from the river towards the forest, beheld a huge jaguar lying under the thick foliage of a ceiba within eighty steps of him. This was, to use his own expression, one of those "accidents in life, against which we might seek in vain to fortify our reason."

"I was extremely frightened, yet sufficiently master of myself and my motions, to enable me to follow the advice which the Indians had so often given us, how to act in such cases. I continued to walk on, without running; avoided moving my arms; and thought I observed that the jaguar's attention was fixed on a herd of chiguire, which were crossing the river. I then began to return, making a large circuit toward the edge of the water; as the distance increased, I thought I might accelerate my pace. How often was I tempted to look back, in order to assure myself that I was not pursued! Happily, I yielded very tardily to this desire. The jaguar had remained motionless. The enormous cats with spotted robes are so well fed in countries abounding in chiguire, pecaris, and deer, that they rarely attack men. I arrived at the boat, out of breath, and related my adventure to the Indians. They appeared very little moved by it; yet after having loaded our firelocks, they accompanied us to the ceiba, beneath which the jaguar had lain. He was there no longer, and it would have been imprudent

to have pursued him into the forest, where we must have dispersed, or marched in file, amid intertwining lianas."

On the evening of the same day, (the 3rd of April,) the travellers passed the mouth of a stream, named the *Cano del Manati*, on account of the immense number of manatees caught there every year. This aquatic animal abounds in the Orinoco, below the cataracts, and in its tributaries, the Meta and the Apure; it generally attains the length of ten or twelve feet, and weighs six or eight hundred pounds. Its flesh is said to be very savoury, and to resemble pork, but is considered unwholesome; when salted and dried in the sun, it will keep for a year. The monks take the liberty of regarding it as a fish; and thus it is in great request during Lent. The fat is used in the operations of cooking and for the lamps in the churches; the hide, which is a foot and a-half in thickness, is cut into slips, which serve for cordage, and likewise for the whips which are used to punish the slaves.

The night was passed on the shore, two persons keeping watch. The fires lighted by the boatmen attracted the crocodiles and dolphins; a jaguar, with her cub, approached the party, but was driven away, and soon afterwards the dog was bitten in the nose by a large vampire bat. On the following night, as they were about to sling the hammocks, they discovered two large jaguars concealed behind a tree; so they embarked again, and took up their quarters elsewhere. On the 5th of April, they reached the point where the Apure joins the Orinoco; as they approached the junction, they were much struck with the decrease of water. The breadth of the stream was reduced to between 130 and 170 yards, and its depth to twenty feet. The canoe touched several times on shoals, and was towed by a line.

CHAPTER XII.

Embarkation on the Orinoco—Change of scenery—A Carib Chieftain
—Traditions of the Natives—Gathering of turtles' eggs on the
shores of the Orinoco—The Missionaries—Cunning of the jaguars.

Soon after leaving the Apure and entering upon the Orinoco, our travellers found themselves in a region which presented an entirely different aspect. "An immense plain of water," says Humboldt, "stretched before us like a lake, as far as we could see. White-topped waves rose to the height of several feet, from the conflict of the breeze and current. The air resounded no longer with the piercing cries of the heron, the flamingoes, and the spoonbills, crossing in long files from one shore to the other. Our eyes sought in vain those water-fowls, the inventive snares of which vary in each tribe. All nature appears less animated. Scarcely could we discover in the hollows of the waves a few large crocodiles, cutting obliquely, by the help of their long tails, the surface of the agitated waters. The horizon was bounded by a zone of forests, but these forests no where reached so far as the bed of the river. A vast beach, constantly parched by the heat of the sun, desert and bare as the shores of the sea, resembled at a distance, from the effects of the mirage, pools of stagnant water. These sandy shores, far from fixing the limits of the river, rendered them uncertain by approaching or withdrawing them alternately, according to the variable action of the inflected rays."

"In these scattered features of the landscape, in this character of solitude and of greatness, we recognise the

course of the Orinoco, one of the most majestic rivers of the New World. The water, like the land, displays everywhere a characteristic and peculiar aspect. The bed of the Orinoco resembles not the bed of the Meta, the Guaviare, the Rio Negro, or the Amazon. These differences do not depend altogether on the breadth or the velocity of the current; they are connected with a multitude of impressions, which it is easier to perceive upon the spot, than to define with precision. Thus, the mere form of the waves, the tint of the waters, the aspect of the sky and the clouds, would lead an experienced navigator to guess, whether he were in the Atlantic, in the Mediterranean, or in the equinoctial part of the great ocean."

The short broken waves at the junction of the two rivers, rendered the passage into the Orinoco exceedingly disagreeable. The breadth of the river here was found to be nearly 12,200 feet, or about two miles and a third; in the height of the rainy season, it is said to extend to about 33,300 feet. As they ascended the stream, the distant mountains of Encarnada, forming a continued chain from west to east, seemed to rise from the water, as land rises above the horizon at sea. At the little port or landing-place of the same name the travellers landed to examine the neighbouring rocks; and here they met with a Carib cacique, who was going up the Orinoco in his canoe to join in the famous fishing of turtles' eggs. His canoe was rounded toward the bottom, and followed by a smaller boat, called *curiara*. "He was seated beneath a sort of tent, *toldo*, constructed, as well as the sail, of palm leaves. His cold and silent gravity, the respect with which he was treated by his attendants, every thing denoted him to be a person of importance. He was equipped, however,

in the same manner as his Indians. They were all equally naked, armed with bows and arrows, and covered with onoto, which is the colouring fecula of the *bixa orellana*. The chief, the domestics, the furniture, the boat, and the sail, were all painted red. These Caribbees are men of an almost athletic stature; they appeared to us much taller than the Indians we had hitherto seen. Their smooth and thick hair, cut upon their foreheads, like that of choristers, their eyebrows painted black, their look at once gloomy and animated, give their physiognomy a singular hardness of expression. Having till then seen only the skulls of some Caribbees of the West India islands preserved in the collections of Europe, we were surprised to find, that these Indians, who were of pure race, had the forehead much more rounded than it has been described. The women, very tall, but disgusting from their want of cleanliness, carried their infants on their backs, having their thighs and legs bound at certain distances by broad stripes of cotton cloth. The flesh, strongly compressed beneath the ligatures, was swelled in the interstices. It is generally to be observed, that the Caribbees are as attentive to their exterior, and their ornaments, as it is possible for men to be, who are naked and painted red. They attach great importance to certain forms of the body; and a mother would be accused of culpable indifference to her children, if she did not employ artificial means to shape the calf of the leg after the fashion of the country. As none of our Indians of Apure understood the Caribbee language, we could obtain no information from the Cacique of Panama respecting the encampments that are made at this season in several islands of the Orinoco for collecting turtles' eggs."

Passing the night of the 5th on shore, our travellers continued their ascent of the river on the following day; and passed a district inhabited by Indians of a gentle race, addicted to agriculture. The natives here, in common with most of the tribes of the Upper Orinoco, retain a belief that "at the time of the *great waters*, when their fathers were obliged to betake themselves to their boats, in order to escape from the general inundation, the waves of the sea beat upon the rocks of Encaramada." The Tamanacs account for the preservation of the human race, by relating a fable similar to the classical story of Pyrrha and Deucalion, told by Ovid. They say that a man and woman saved themselves on a high mountain, called *Tamanacu*, situated on the back of the Asevera, and casting behind them, over their heads, the fruits of the *Mauritia* palm, they saw the nuts contained in those fruits produce men and women, who re-peopled the earth. Upon this subject, Humboldt remarks, that similar traditions exist among all the nations of the earth, and "like the relics of a vast shipwreck are highly interesting in the study of our own species." He mentions, however, a curious record of former times, in the shape of hieroglyphical figures, sculptured on high rocks on the borders of the Orinoco. "A few leagues from Encaramada, a rock called *Tepumereme*, or 'the painted rock,' rises in the midst of the savannah. It displays resemblances of animals, and symbolic figures, resembling those we saw in going down the Orinoco, at a small distance below Encaramada, near Caycara. Similar rocks in Africa are called by travellers *Fetish Stones*. I shall not make use of this term, because fetishism does not prevail among the natives of the Orinoco; and the figures of stars, of the sun, of tigers, and of crocodiles,

which we found traced upon the rocks in spots now uninhabited, appeared to me in no way to denote objects of worship of those nations. Between the banks of the Cassiquiare and the Orinoco, between Encaramada, the Capuchino, and Caycara, these hieroglyphic figures are often placed at great heights on the walls of rock, that could be accessible only by constructing very lofty scaffolds. When the natives are asked how those figures could have been sculptured, they answer, with a smile, as relating a fact of which a stranger, a white man only, could be ignorant, that at the period of the *great waters*, their fathers went to that height in boats."

"These ancient traditions of the human race," continues Humboldt, "which we find dispersed over the surface of the globe, like the fragments of a vast shipwreck, are of the greatest interest in the philosophical study of our species. Like certain families of plants, which, notwithstanding the diversity of climates, and the influence of heights, retain the impress of a common type, the traditions respecting the primitive state of the globe, present, among all nations, a resemblance that fills us with astonishment; so many different languages, belonging to branches which appear to have no connexion with each other, transmit the same facts to us. The substance of the traditions is everywhere almost the same, although each nation gives it a local colouring. In the great continents, as in the smallest islands of the Pacific Ocean, it is always on the highest and nearest mountain that the remains of the human race were saved; and this event appears so much the more recent the more uncultivated the nations are, and the shorter the period since they have begun to acquire a knowledge of themselves. When we attentively examine the

Mexican monuments anterior to the discovery of America; penetrate into the forests of the Orinoco, and become aware of the smallness of the European establishments, their solitude, and the state of the tribes which retain their independence,—we cannot allow ourselves to attribute the agreement of these accounts to the influence of missionaries, and to that of Christianity, upon national traditions. Nor is it more probable that the sight of marine bodies, found on the summits of mountains, presented to the tribes of the Orinoco the idea of those great inundations which, for some time, extinguished the genus of organic life upon the globe.”

Continuing their voyage, they landed towards mid-day on an island near the Boca de la Tortuga, (or Mouth of the Turtle) celebrated for its annual turtle-fishery or harvest of eggs. They found three hundred Indians encamped here in huts of palm leaves, with a few white men, who had come to purchase the produce of their labour. Each tribe of the Indians lived apart from the rest, and was distinguished by its peculiar painting of the skin. Our traveller was kindly received by a missionary from the Uruana, a native of the country, who showed them over the island; he was particularly astonished to see Europeans, and thought the object of their expedition very mysterious, hardly conceiving it possible that they could have left their own country to be devoured by moschettoes, and to measure lands which were not their own. The object of his presence, he told them, was to celebrate mass during the “harvest,” to procure a supply of oil for the church, and to keep in order this “republic of Indians and Castilians.”

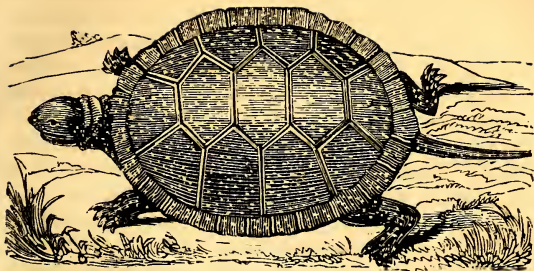
According to the Indians, there were only three

places on the Orinoco where the turtles assembled annually in great numbers to lay their eggs; and these were situated between the mouth of the Apure and the great cataracts. The animal, when full-grown, weighs from forty to fifty pounds, and its eggs are much larger than those of a pigeon; it is a large fresh-water tortoise, called the *arrau*. Troops of them issue from the water, in the month of January, to repose on the sands and warm themselves in the sun; during February, they continue basking on the beach in the day-time, and, early in March, they repair to the small islands to lay their eggs. Thousands of them are then seen ranged in files along the shores; and the Indians take great precautions to prevent their being disturbed, placing sentinels at certain distances, and desiring persons, who pass by in boats, to keep in the middle of the river. The laying of the eggs begins soon after sunset. With their hind feet, which are very long and furnished with claws, the animals dig holes about three feet in diameter, and two in depth; in these holes they deposit their eggs, during the night. In the confusion which prevails from their anxiety to get rid of the burden, many of the eggs are broken. Sometimes daylight surprises them before they have finished the operation. Those that are thus situated are so anxiously occupied in depositing their eggs, and closing up the holes so as to hide them from the jaguars, that they become insensible to their own danger; they continue to work with the greatest diligence in the presence of the Indians, who call them "mad tortoises."

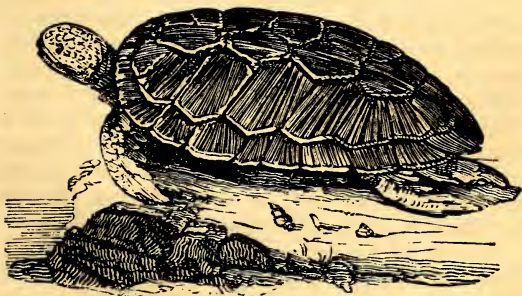
The operation of the gathering commences about the beginning of April, and is conducted with great regularity under the superintendence of the missionary.

The depth of the bed of eggs is ascertained by means of a pole thrust into the earth; and the ground is then allotted among the tribes. The natives then remove the earth with their hands, collect the eggs in baskets, and afterwards throw them into long wooden troughs, filled with water, where they are broken and stirred, and left exposed to the sun. The yolk rises to the surface, and, at the proper time, is taken off and boiled. When well prepared, the oil thus obtained is scarcely yellow and so clear and inodorous, that the missionaries compare it to the best olive oil; and it is used both for lamps and the operations of cookery. Humboldt, however, says that it has generally a putrid smell, some of the eggs having the little tortoises already formed in them. A space of ground, 120 feet in length and 30 in breadth, has been known to produce 100 botijas or jars of oil, each containing from 1000 to 1200 cubic inches, or from about $3\frac{1}{3}$ to $4\frac{1}{3}$ British imperial gallons. The shores near the Boca de la Tortuga furnish 1000 jars annually, and the three stations jointly are supposed to afford 5000 jars. It requires 5000 eggs to fill a jar; so that estimating at 100 or 116, the number of eggs that one tortoise produces, and reckoning that one-third of them is broken at the time of laying, particularly by the "mad tortoises," we may presume that 330,000 tortoises assemble annually, and lay 33,000,000 of eggs on the three shores appropriated to this harvest.

But the result of these calculations is undoubtedly much below the truth; many tortoises lay only sixty or seventy eggs, and a great number of these animals are devoured by jaguars at the moment of their getting out of the water. A large number of eggs are taken away by the Indians to be eaten, after having been dried in



Green Tortoise, (*Chelys Viridis*.)



Green Turtle, (*Testudo Mydas*.)



the sun; and many are carelessly broken by them in the gathering. A large number, likewise, are hatched before they can be dug up; Humboldt saw the whole shore of the Orinoco swarming with little tortoises an inch in diameter, which escaped with difficulty from the pursuit of the Indian children. If to these considerations, remarks Humboldt, be added that all the *arraus* do not assemble on the three shores where encampments are formed, that there are many which lay their eggs in solitude, we must admit that the number of turtles which annually deposit their eggs on the banks of the Lower Orinoco is nearly a million.

The operations of gathering the eggs, and preparing the oil, occupy three weeks; and it is only during this period that the missionaries have any communication with the coast and the civilized neighbouring countries. The Franciscan monks, who live south of the cataracts, “come to the *harvest* of eggs less to procure oil, than to see, as they say, *white faces*, and to learn whether the king inhabits the Escorial or Saint Ildefonso, whether the convents remain suppressed in France, and, above all, whether the Turks continue to keep quiet. These are the only subjects that are interesting to a monk of the Orinoco, and on which the little traders of Angostura, who visit the encampments, can give no very exact notions. In those distant countries, no doubt is ever entertained of the news brought by a white man from the capital. To doubt is almost to reason; and how can it be otherwise than irksome, to exercise the understanding, where people pass their lives, complaining of the heat of the climate and the stinging of moschettoes?”

The jaguar is a great enemy to the tortoises; it follows them to the shores where the laying of eggs is to

take place, and in order to devour them at its ease, turns them on their backs. In this situation the turtles are unable to rise; and as the jaguar often turns many more than he can eat in one night, the Indians often avail themselves of his cunning and malignant avidity. "When we reflect on the difficulty that the naturalist finds in getting out the body of the turtle without separating the upper and under shells, we cannot sufficiently admire the suppleness of the tiger's paw, which empties the double armour of the *arrau* as if the adhering parts of the muscles had been cut by means of a surgical instrument." The jaguar will also pursue the turtle into the water when it is not very deep; and even dig up its eggs. The crocodiles, herons, and *gallinazo* vultures, are also great enemies to the turtles, devouring the little ones just after they are hatched. The year before Humboldt's visit the island of Pararuma had been so much infested by crocodiles, that in one night the Indians caught eighteen, each twelve or fifteen feet in length, by means of curved pieces of iron, baited with the flesh of the manatee.

CHAPTER XIII.

Departure from the Boca de la Tortuga—Accident on the river from the high wind—A night on a barren island—Lethargy of the crocodiles during the dry seasons—Passage of Baraguan—Aspect of nature—Impurities of the waters—Painted Indians at Pararuma—Curious species of monkeys—Their sagacity.

ABOUT four in the afternoon, the travellers set sail. The wind was fresh, and blew in squalls. Since they had entered the mountainous part of the country

they had discovered that their canoe carried sail very badly; but the master was desirous of showing the Indians, who were assembled on the beach, that in going as near the wind as possible, he should reach at a single tack the middle of the river.

“At the very moment when he was boasting of his dexterity,” says Humboldt, “and the boldness of his manœuvre, the force of the wind upon the sail became so great, that we were on the point of going down. Our side of the boat was under water, which entered with such violence that it was up to our knees. It passed over a little table, at which I was writing, in the after part of the boat. I had some difficulty to save my journal, and, in an instant, we saw our books, papers, and dried plants all swimming. M. Bonpland was lying asleep in the middle of the canoe. Awakened by the entrance of the water, and the cries of the Indians, he judged of our situation with that coolness which he always displayed in the most difficult circumstances. The lee-side righting itself from time to time during the squall, he did not consider the boat as lost. He thought that were we even forced to abandon it, we should save ourselves by swimming, since there was no crocodile in sight. Amid this uncertainty, we saw the cordage of the sail suddenly give way. The same gust of wind that had thrown us on our beam, served also to right us. We instantly laboured to bale the boat with calebashes; the sail was set afresh; and in less than half an hour, we were again in a state to proceed. The wind had abated a little. Squalls alternating with dead calms are very common in that part of the Orinoco which is bordered by mountains. They become very dangerous for boats deeply laden, and without decks. We had escaped as by a miracle. To the

reproaches that were heaped on our pilot for having kept too near the wind, he opposed his Indian phlegm, and answered coolly, 'that the whites would not want sun enough on those banks to dry *their papers*.' We lost only one book, the first volume of the *Genera Plantarum*, of Schreber, which had fallen into the water. Such losses are felt by those who are reduced to a small number of works of science."

At the beginning of the night, they landed on a barren island in the middle of the river. They seated themselves on large shells of turtles, which they found scattered on the beach; and supped by a beautiful moonlight. "What delightful satisfaction did we feel at finding ourselves thus assembled! We figured to ourselves the situation of a man who had been saved alone from shipwreck, wandering on these desert shores, meeting at every step with other rivers that fall into the Orinoco, and which it is dangerous to pass by swimming, on account of the multitudes of crocodiles and *caribe* fishes. We represented to ourselves such a man awake to the most tender affections of the soul, ignorant of the fate of the companions of his misfortune, and thinking more of them than of himself. If we love to indulge such melancholy meditations, it is because, when just escaped from danger, we seem to feel something like a want of strong emotions. The minds of each of us were full of what we had just witnessed. There are periods in life, when, without being discouraged, the future appears more uncertain. It was only three days since we had entered the Orinoco; and there yet remained three months for us to navigate rivers encumbered with rocks, and in smaller boats than that in which we had nearly perished."

The night was intensely hot. Not finding any trees to which they could fasten their hammocks, our travellers lay upon skins, spread on the ground. They were surprised to find that at this place their fires did not prevent the approach of the jaguars. Those animals swam across the arm of the river between the island and the main land, and towards morning their cries were heard very near. The Indians said that the jaguars are always most frequent in those regions during the period of collecting the turtles' eggs, when likewise they displayed the greatest intrepidity.

On the following day, they continued their ascent of the river, and passed on their right the mouth of the great river Arauca, opposite to which, on the other side, was the small mission of Uruana. The breadth of the Orinoco here was more than three miles, it being the season of the high-water; yet they were at the distance of nearly 700 miles above its mouth. Although the right bank of the river continued low for some distance beyond this point, the mountains on the eastern or left bank approached nearer to the stream; sometimes, the high and wooded grounds prevented the winds from filling their sails; while at others, the narrow passes between the mountains sent out gusts of great violence, though of short duration. The number of crocodiles in the river was found to increase above the junction with the Arauca; they had come according to the Indians from the inland savannahs, where they had been buried in the dried mud. As soon as the first showers awaken them from their lethargy, they crowd in troops, and hasten towards the river, there to disperse again.

“Here in the equinoctial zone, it is the increase of humidity that recalls them to life; while in Georgia and Florida, in the temperate zone, it is the augmentation

of heat that rouses these animals from a state of nervous and muscular debility, during which the active powers of respiration are suspended, or singularly diminished. The season of great drought, improperly called the *summer* of the torrid zone, corresponds to the winter of the temperate zone; and it is a curious physiological phenomenon to observe the alligators of North America plunged into a *winter-sleep* by excess of cold, at the same period when the crocodiles of the Llanos begin their siesta, or summer sleep. If it were probable that these animals of the same family had heretofore inhabited the same northern country, we might suppose that in advancing toward the equator, they feel the want of repose, after exercising their muscles for seven or eight months; and that they retain under a new sky the habits which appear to be essentially linked with their organization.

Proceeding onwards they reached a part of the river where its bed is narrowed by the mountains of Baraguan, and the stream thus assumes the appearance of a strait. This *passage* presented a picturesque scene. The granite rocks were perpendicular; their summits did not exceed in height 120 toises, but they derived a majestic character from their situation in the midst of a small plain, the steepness of their declivities, and the barrenness of their sides, which were destitute of vegetation. At the middle of the strait, the breadth of the river was found to be 1900 yards; its general width from Uruana to the junction with the Meta, being twice or three times as great.

“We looked in vain for plants in the clefts of the rocks, which are as steep as walls, and furnish some traces of stratification. We found only an old trunk of aubletia, with large pomiform fruit, and a new species

of the family of the Apocynææ. All the stones were covered with an innumerable quantity of iguanas, and geckoes with spreading and membranous fingers. These lizards, motionless, the head raised, and the mouth open, seemed to suck in the open air. The thermometer placed against the rock, rose to $122\cdot4^{\circ}$. The soil appeared undulating, from the effect of mirage, without a breath of wind being felt. The sun was near the zenith, and its dazzling light, reflected by the surface of the river, contrasted with the reddish vapours that enveloped all the surrounding objects. How vivid is the impression produced by the calm of nature, at noon, in these burning climates! The beasts of the forests retire to the thickets; the birds hide themselves beneath the foliage of the trees, or in the crevices of the rocks. Yet, amid this apparent silence, when we lend an attentive ear to the most feeble sounds transmitted by the air, we hear a dull vibration, a continual murmur, a hum of insects, that fill, if we may use the expression, all the lower strata of the air. Nothing is better fitted to make man feel the extent and power of organic life. Myriads of insects creep upon the soil, and flutter round the plants parched by the ardour of the sun. A confused noise issues from every bush, from the decayed trunks of trees, from the clefts of the rocks, and from the ground undermined by the lizards, millepedes, and *blindworms*. These are so many voices proclaiming to us, that all nature breathes; and that, under a thousand different forms, life is diffused throughout the cracked and dusty soil, as well as in the bosom of the waters, and in the air that circulates around us.

“The sensations which I here recalled to my mind, are not unknown to those, who, without having advanced to the equator, have visited Italy, Spain, or

Egypt. That contrast of motion and silence, that aspect of nature at once calm and animated, strikes the imagination of the traveller, when he enters the basin of the Mediterranean, within the zone of olives, dwarf palms, and date trees."

The travellers passed the night near this spot; and "could have wished to find a spring" in the Baraguan; the water of the river having a smell of musk, and a sweetish taste, exceedingly disagreeable. Both in the Apure and in the Orinoco, they found the water sometimes very fit to drink; while at others it seemed loaded with gelatinous matter. "It is the *bark*," (the coriaceous covering,) "of the putrefied cayman, that is the cause," said the natives; "the older the cayman, the more bitter his bark." There was little doubt that the carcasses of these large reptiles and the manatees, as well as the presence of porpoises, with their mucilaginous skin, might contaminate the water of the river, especially in the creeks where the stream has little velocity; yet it was not always the case that where they found the most fetid water, there dead animals were accumulated. "When," feelingly observes our experienced traveller, "in such ardent climates, where we are constantly tormented by thirst, we are reduced to drink the water of a river at the temperature of 80° or 82°, it were to be wished at least that water so hot, and so loaded with sand, should be free from smell."

On the morning of the 9th, they reached Pararuma, where they saw an encampment of Indians, similar to that which they had seen at the *Boca de la Tortuga*. In this instance, however, the unfortunate natives were too late in assembling, to collect the turtles' eggs; the little turtles had been several days out of the shell before the camp was formed. The delay had proved

profitable to the crocodiles, and the *garzes* (a species of large white heron); both those animals, having a partiality for the flesh of young turtles, had devoured an immense number, when they came out of the earth, after the evening twilight, to visit the river. The zamuro, or carrion-vultures, are said to be too indolent to hunt after sunset; but, hovering around the shores in the day-time, they alight in the midst of an Indian encampment to steal food. Oftentimes they can find no other means of satisfying their voracity, than by attacking young crocodiles, seven or eight inches long, either on the land, or in water of little depth; and it is curious then to see with what address these little animals will defend themselves for some time against their ravenous assailants. As soon as they perceive the vultures, they raise themselves on their fore-paws, bend their back, and lift up the head, opening their wide jaws. They turn repeatedly, though slowly, towards their enemy, to show him their teeth, which even when the animal is recently come out of the egg are very long and sharp. It frequently happens that, while one of the zamuros attracts the whole attention of the young crocodile, another pounces, unforeseen, upon it, and grasping its neck, bears it off into the higher regions of the air. Our travellers had an opportunity of observing this manœuvre during several mornings, at the town of Mompex, on the borders of the Magdalena, where they had collected in a spacious court, surrounded by a wall, more than forty crocodiles, which had been hatched fifteen or twenty days.

At Pararuma they found some white traders, from Lingostura, who complained bitterly of the "bad harvest," and the mischief done by the jaguars among the turtles' eggs; and also some missionary monks, whose

ample blue garments, shorn heads, and long beards, gave them the appearance of natives of the East. These poor priests had suffered from tertian fevers for some months; "pale and emaciated," says Humboldt, "they easily convinced us that the countries we were going to visit were not without danger to the health of travellers."

At Pararuma their Indian pilot left them, being unacquainted with the rapids higher up. They thought themselves fortunate in procuring, from one of the monks, a fine canoe, at a very moderate price, and in securing the company of Father Bernardo Zea, missionary of the Atures and Maypures, near the great cataracts, who was in hopes of re-establishing his health by visiting the more healthy stations of the Rio Negro. As the number of natives who assist in passing boats over the rapids is very small, our travellers would have been exposed to the risk of spending whole weeks in these humid and unhealthy regions, had they not been joined by this monk.

The assemblage of Indians at Pararuma excited their interest: "How difficult," says Humboldt, "to recognise, in this infancy of society,—in this collection of dull, taciturn, and unimpassioned Indians,—the original character of our species! Human nature is not seen here arrayed in that gentle simplicity, of which poets, in every language, have drawn such enchanting pictures. The savage of the Orinoco appeared to us as hideous as the savage of the Mississippi, described by the philosophical traveller who best knew how to paint men in the various regions of the globe. One would fain persuade himself that these natives of the soil, crouched near the fire, or seated on large shells of turtles, their bodies covered with earth and grease, and

their eyes stupidly fixed, for whole hours, on the drink which they are preparing, far from being the original type of our species, are a degenerate race, the feeble remains of nations which, after being long scattered in the forests, have been again immersed in barbarism."

Humboldt enters into some interesting details, concerning the practice which these Indians have of painting the naked body. Like some of those in North America, they have a passion for red colours, which they obtain from the leaves and seeds of certain plants. They use, also, a black colour. They mix these pigments with turtle-oil or grease of some kind, and apply them according to the pattern of the tribe, with such modifications as individual taste may suggest. Some tribes paint only the head and hair; others paint the whole body. There exists a fashion in painting among the Indians, as in dress among civilized nations; and our travellers saw some Indians at Pararuma with blue jackets and black buttons painted on them. "Seen at a distance," Humboldt says, "these naked men appear to be dressed in laced clothes." "If *painted nations*," he adds, "had been examined with as much attention as *clothed nations*, it would have been perceived that the most fertile imagination, and the most mutable caprice, have created the fashions of painting as well as those of garments." This personal decoration of the Indians is a source of great extravagance; and some of the missionaries are said to speculate on their state of nudity, by storing up the *chica*, and other pigments, and selling them at a high price to the natives. Humboldt tells us that a man of large stature will with difficulty obtain, by a fortnight's labour, enough to purchase the *chica* to paint himself red. Thus, as in our temperate climates, we say of a

poor man, that "he has not enough to clothe himself;" the Indians of the Orinoco say "that man is so poor that he has not enough to paint half his body." The operation of painting is sometimes a very tedious one, requiring incredible patience. One specimen of this kind of decoration, mentioned by Humboldt, was a sort of lattice-work, formed of black lines, crossing on a red ground, each little square so formed having a black dot in the centre. This "research of ornament" seems the more curious, when we consider that if exposed to a violent shower, these elaborate and carefully-executed paintings are washed out. The black pigment of the *caruto*, however, resists the action of water a long time: our travellers, one day, in sport with the Indians, caused their faces to be marked with spots and strokes of *caruto*, and when they arrived at Angostura, in the midst of Europeans, the marks were still visible.

The reflecting traveller, who observes the painting and tattooing in which the savage takes so great delight and pride, cannot, therefore, but be singularly struck with the remains of ancient barbarism, retained amid all the usages of civilization, when he remembers the cosmetics with which the ladies of Europe still, in great measure, labour to adorn and improve the appearance of their persons.

At Pararuma our travellers had an opportunity of seeing alive several animals which they had previously seen only in the collections of Europe. The missionaries carry on a little commerce in the *gallitos*, or rock-manakins, and in several species of monkeys, which are in great request on the coast. Two species of monkeys particularly attracted their attention, the *titis* and *viuditas*. The *titi* has a white face, with a little spot of bluish black covering the mouth and the

point of the nose. No other monkey has so much the physiognomy of a child; "there are the same expression of innocence, the same playful smile, the same rapidity in the transition from joy to sorrow. Its large eyes are instantly filled with tears, when it is seized with fear." It is extremely fond of insects; and Humboldt mentions a remarkable instance of its sagacity in distinguishing them in the plates annexed to one of Cuvier's works on Natural History. The engravings were not coloured; yet the *titi* sharply put out its little hand, in the hope of catching a grass hopper or a wasp, every time that the plate on which those insects were represented was shown to it. Engravings of skeletons or heads of mammiferous animals were regarded with the greatest indifference. "I shall observe, on this occasion," says Humboldt, "that I have never heard of a picture on which hares or deer were represented, of their natural size, and with the greatest perfection, having made the least impression, even on hunting-dogs of the most improved intelligence. Is there an example, well ascertained, of a dog recognizing a full-length picture of its master? In all these cases, the sight is not assisted by the smell."

The *viudita*, or "young widow," as it has been called by the missionaries, forms a striking contrast with the *titi*, and other four-handed animals long known in Europe. The hair of this little animal is soft, glossy, and of a fine black; its face is covered with a square mask, of a whitish colour, tinged with blue, and this mask contains the eyes, nose, and mouth. "The ears have a rim; they are small, very pretty, and almost bare. The neck of the *widow* presents, in front, a white band an inch broad, and forming a semicircle. The feet, or rather the hinder hands, are black, like

the rest of the body; but the fore hands are white on the outside, and of a glossy black within. It is in these marks, or white spots, that the missionaries think they recognise the veil, the neckerchief, and the gloves of a *widow in mourning*. The character of this little monkey, which sits up on its hinder extremities only when eating, is very little indicated in its appearance. It has a wild and timid air; it often refuses the aliments that are offered to it, even when tormented by a ravenous appetite. It has little inclination for the society of other monkeys; the sight of the smallest saimiri (or titi) puts them to flight. Its eye denotes great vivacity. We have seen it remain whole hours motionless, without sleeping, and attentive to everything that was passing around. But this wildness and timidity are merely apparent. The *viudita*, alone, and left to itself, becomes furious at the sight of a bird. It then climbs and runs with astonishing rapidity; darts upon its prey like a cat, and kills whatever it can seize." Our traveller justly remarks that, in order to study the manners of animals, it is a great advantage to observe them in the open air, and not in houses, where they lose all their natural vivacity.

CHAPTER XIV.

Departure from Pararuma—Mode of navigating the Orinoco—Military conversion of the natives—Inundations of the river—Ancient floods—Rapids and cascades—Subterranean sounds—Memnonium—The Meta—The Stone of Patience—Sufferings from insects—Arrival at Panumana.

THE travellers set sail from Pararuma on the 10th of April, at ten in the morning. Their canoe was forty feet long and three broad; like all Indian boats, it was simply the trunk of a tree, hollowed out by the double

aid of the hatchet and of fire. To gain something in breadth, a sort of lattice-work had been constructed on the after part of the boat, with branches of trees reaching on each side beyond the gunwale; but the roof of leaves—the *toldo*, as it is called—which covered this lattice-work, was so low that the inmate was obliged to lie down without seeing anything, or to sit double, if he preferred being seated. The necessity of carrying the canoe across the rapids, leading from one river to another, and the fear of giving too much hold to the wind, prevented them from having the *toldo* higher. This shed was intended for four persons; the legs reached far beyond it, and in a fall of rain half the body was wetted. The travellers reposed on ox-hides, or tiger-skins, thrown over branches of trees, which caused some painful sensations, through so thin a covering. Humboldt has depicted the manner of navigating on the Orinoco, in such a bark as this, in a very interesting manner. “The fore part of the boat,” he says, “was filled with Indian rowers, furnished with paddles three feet long, in the form of spoons. They were all naked, seated two by two, and rowed in cadence with surprising uniformity. Their songs were sad and monotonous. The small cages, containing our birds and our monkeys, the number of which augmented as we advanced, were hung, some to the *toldo*, and others to the bow of the boat. This was our *travelling menagerie*. Notwithstanding the frequent losses occasioned by accidents, and above all by the fatal effects of exposure to the sun, we had fourteen of these little animals alive at our return from the Casiquiare. Naturalists who wish to collect and bring living animals to Europe, might cause boats to be constructed expressly for this purpose at Angostura, or at

Grand Para, the two capitals, situate on the banks of the Orinoco and the Amazon; the first third of which boats might contain two rows of hutches, sheltered from the ardour of the sun. Every night, when we established our watch, the collection of animals and our instruments, occupied the centre; around these were placed first our hammocks, then the hammocks of the Indians, and on the outside were the fires that are thought indispensable against the attacks of the jaguar. About sunrise the monkeys in our cages answered the cries of the monkeys of the forest. These communications between animals of the same species, sympathizing with one another, though unseen,—one party enjoying that liberty which the other regrets,—have in them something melancholy and affecting.

“In a canoe not three feet wide, and so encumbered, there remained no other place for the dried plants, trunks, a sextant, a dipping-needle, and the meteorological instruments, than the space below the lattice-work of branches, on which we were compelled to remain stretched the greater part of the day. To take the least object out of a trunk, or to use an instrument, it was necessary to gain the shore, and disembark. To these inconveniences were joined the torment of the moschetoës, abounding under this low roof, and the heat radiated from the palm-leaves, which had their upper surface continually exposed to the sun’s rays. We attempted every instant, and always without success, to amend our situation. While one of us laid himself under a sheet to ward off the insects, the other insisted on having green wood lighted beneath the *toldo*, in order to drive them away by the smoke. The painful sensations experienced by the eyes, and the increase of a temperature already stifling, rendered

both of these endeavours alike impracticable. With some gaiety of temper, with dispositions of mutual benevolence, and with a vivid taste for the majestic nature of these great valleys or rivers, travellers easily support evils which become habitual."

At a short distance above Pararuma, they passed, on the east, a mountain with a bare top, projecting in the form of a promontory. Its height was nearly 300 feet. It had served as a station for the Jesuits, who had constructed upon it a small fortress, furnished with three batteries of cannon, and constantly occupied by a military detachment. The fort had been destroyed since the dissolution of the society; but the place was still called *El Castillo*, or the Castle. The garrison which the Jesuits used to maintain on this rock, was not intended merely to protect the missionaries against the incursions of the Caribbees: it was employed in that peculiar kind of offensive warfare known in these parts by the name of *conquista de almas*, "conquest of souls." The soldiers, excited by the hope of gain, used to make incursions into the lands of the independent Indians, killed all those who made any resistance, burnt their huts, destroyed the plantations, and carried away the old men, women, and children, as prisoners. The captives were divided among the missions of the Meta, the Rio Negro, and the Upper Orinoco, being sent to such a distance as prevented their return to their native district. This violent mode of "conquering souls" was prohibited by the Spanish laws; but the civil governors allowed it, and the Jesuit superiors boasted of it, as beneficial to religion and the aggrandisement of the missions. "The voice of the gospel," said one of them, "is heard only where the Indians have heard also the voice of arms. Mildness is a very slow measure; by chastising

the natives we facilitate their conversion." Happily, however, the same system was not followed by the Franciscan, Dominican, and Augustine monks, who now govern a vast portion of South America, "and who," says Humboldt, "by the mildness or harshness of their manners, exert a powerful influence over the fate of so many thousands of natives. Military incursions are almost entirely abolished, and when they do take place they are disavowed by the superiors of the orders."

Our travellers passed the night of the 10th, at the priest's house, a *convento*, in the small village of Carichana; nearly a fortnight had elapsed since they slept under a roof. This mission had been planted at the distance of three-quarters of a league from the river, to avoid the effects of the inundations. The Orinoco had risen several inches on the 10th, and the natives were rather surprised; as the first swellings are almost imperceptible, and are usually followed by a fall for some days. Our travellers were shown on a granite-rock the marks of the great rise of late years, and found them to be 42 feet high, or double the ordinary rise of the Nile. The measurement, however, was made in a place where the bed of the river is singularly hemmed in by rocks; and it may easily be conceived, says Humboldt, that the effect and height of the increase differ according to the profile of the river; but, what is particularly remarkable, and "has struck the imagination of all who inhabit these countries," is, that at Carichana, and other places where the river has forced its way through the mountains, you see at the height of 100 and sometimes of 130 feet above the present increase of the river, black bands and erosions that indicate the ancient abode of the waters.

"Is this river, then," says Humboldt, "the Orinoco,

which appears to us so imposing and majestic, merely the feeble remnant of those immense currents of fresh water, which, swelled by Alpine snows, or by more abundant rains, everywhere shaded by dense forests, and destitute of those beaches that favour evaporation, formerly traversed the regions to the east of the Andes, like arms of inland seas? What must then have been the state of those low countries of Guiana, which now experience the effects of annual inundations? What a prodigious number of crocodiles, lamantines, and boas, must have inhabited these vast regions, alternately converted into pools of stagnant water and arid plains! The more peaceful world in which we live has succeeded to a world of tumult. Bones of mastodons and real American elephants are found dispersed over the platforms of the Andes. The megatherium inhabited the plains of Uruguay. By digging the earth more deeply in high valleys, which at the present day are unable to nourish palms or tree-ferns, we discover strata of coal, containing gigantic remains of monocotyledonous plants*. There was therefore a remote period, when the tribes of vegetables were differently distributed, when the animals were larger, the rivers wider and deeper: there stop the movements of nature which we can consult. We are ignorant whether the human race, which, at the time of the discovery of America, scarcely presented a few feeble tribes to the east of the Cordilleras, had yet descended into the plains, or whether the ancient tradition of the *Great Waters*, which we find among all the races of the Orinoco, Erevato, and Caura, belongs to other climates, whence it had been transferred to this part of the new continent."

* These are different kinds of plants, where *one* lobe or albuminous mass surrounds the embryo.

Leaving Carichana on the afternoon of the 11th, our travellers continued their ascent of the river, which became more and more encumbered with little islands or rocks of granite. At one of them, known by the name of *Piedra del Tigre*, or Rock of the Tiger, the water is so deep that no bottom can be found with a line of twenty-two fathoms, each fathom being six feet. Towards evening the weather became cloudy and gloomy, with squalls and dead calms alternately; the rain penetrated through the leafy covering of their shed, but did them some service in driving away the moschetoës which had troubled them all the day.

The granitic rocks in the river form rapids or small cascades, which at first sight alarm the traveller, on account of the continual eddies of the water, but which are not dangerous for boats, although they sometimes occasion inconvenience at the place. Our travellers found the impulse of the waters so strong that they had great difficulty in gaining the land. They were continually driven back to the middle of the current*, when at length two Indians, who were excellent swimmers, leaped into the stream, and,

* The French philosopher, De la Condamine, who was sent out to South America, with other academicians, in the year 1735, to measure the length of a degree of the earth's surface under the equator, speaks of similar rapids and eddies in the Amazon, where its current is impeded by rocks. He mentions one of them at the passage called Escurrebragas, where he was whirled round for an hour and several minutes in a deep creek, under an overhanging rock. "The waters in circulating," says he, "carried me to the middle of the bed of the river, where their meeting with the great current formed waves, which would inevitably have submerged a canoe. The size and solidity of the raft rendered it secure from that danger; but I was always driven back by the violence of the current into the creek, from which I was only extricated by the address of four Indians." He tells us likewise of a poor missionary, who was drawn into one of these eddies and kept there two days, and would doubtless have perished with hunger, if a sudden rise of the river had not again sent him into the middle of the stream.

drawing the boat by a rope, made it fast to a shelf of bare rock, called the *Piedra de Carichana Vieja*. Upon this rock the party passed the night; the thunder continued to roll; the increase of the river became considerable; and they were several times afraid that their frail bark would be forced from the shore by the impetuosity of the waves.

The *Piedra de Carichana Vieja* is one of those rocks at which travellers, who pass along in the Orinoco, have heard from time to time at sunrise, subterraneous sounds resembling those of an organ, and which the missionaries call *laxas de musica*; the young Indian pilot said that "it was witchcraft." Our travellers themselves never heard these mysterious sounds; but from information given to them by witnesses worthy of belief, they did not doubt the existence of the phenomenon. Humboldt supposes it to depend on a certain state of the atmosphere. The shelves of rock, it appears, are full of crevices, deep and very narrow; they are heated during the day to a high temperature, so that they remain throughout the night many degrees warmer than the surrounding atmosphere. This difference of temperature between the subterraneous and the external air, may be conceived to attain its maximum about sunrise, or at that moment which is furthest from the period of greatest heat in the preceding day. May not then, asks Humboldt, the sounds of an organ, which are heard by a person lying on the rock with his ear in contact with the stone, be the effect of a current of air issuing out through the crevices?

"May we not admit," he likewise asks, "that the ancient inhabitants of Egypt, in passing incessantly up and down the Nile, had made the same obser-

vation on some rock of the Thebaid; and that the *music of the rocks* there led to the jugglery of the priests in the statue of Memnon? Perhaps when the rosy-fingered Aurora rendered her son, the glorious Memnon, vocal, the voice was that of a man hidden beneath the pedestal of the statue; but the observation of the natives of the Orinoco, which we relate, seems to explain in a natural manner what gave rise to the Egyptian belief of a stone that poured forth sounds at sunrise."

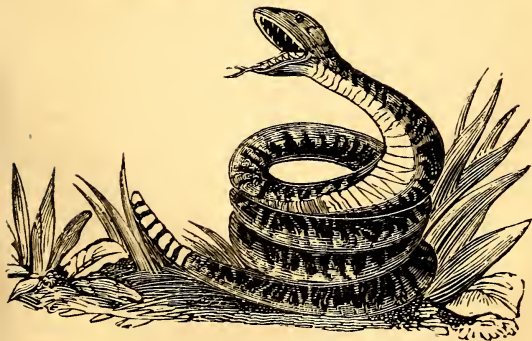
Three of the French savans, who went out to Egypt with Buonaparte's expedition, heard at sunrise in a monument of granite, placed in the centre of the spot on which the greater temple of Karnac stands, a noise resembling that of a "string breaking." This is precisely the comparison used by the ancient writers in speaking of the statue of Memnon; and the French philosophers entertained the same opinion as Humboldt, "that the passage of rarefied air through the fissures of a sonorous stone, might have suggested to the Egyptian priests the juggleries of the Memnonium."

The poetical expression which Humboldt quotes respecting Aurora and her son Memnon, are the actual words of an inscription, which was found to attest that sounds were heard on the 13th of the month Pachon, in the 10th year of the reign of Antoninus; which agrees with the year A.D. 148.

The toucan and rattlesnake seem to occupy the countries from Mexico to the southern parts of Brazil. The toucan is an omnivorous bird, feeding both upon animal and vegetable matters. But their enormous bills are very light, and, being vascular within, favour the organs of smell. By this power they discover the



The Toucan,



Rattlesnake (*Crotalus horridus*).



nests and eggs of other birds, which they are continually plundering. The red-billed toucan is one of the largest species, having the body black and the throat very white.

On the morning of the 12th our travellers set off at four o'clock, and experienced the usual difficulty in passing the rapids, which lay between them and the mouth of the Meta. For six hundred toises* the river was full of granitic rocks; sometimes they passed through channels not five feet broad, and sometimes their canoe was jammed between two blocks of granite. "We sought," says Humboldt, "to avoid those passages into which the waters rushed with a terrible noise. There is no real danger when you are steered by a good Indian pilot. When the current is too difficult to resist, the rowers leap into the water, and fasten a rope to the point of a rock to warp the boat along; this manœuvre is very slow; and we sometimes availed ourselves of it to climb the rocks, among which we were entangled. They are of all dimensions, rounded, very black, glossy like lead, and destitute of vegetation. It is an extraordinary sight to see the waters of one of the largest rivers in the globe in some sort disappear. We perceived, even far from the shore, those immense blocks of granite rising from the ground, and leaning one against another. The intervening channels in the rapids are more than 25 fathoms deep; and are the more difficult to be observed, as the rocks are often narrow at their bases, and form vaults suspended over the surface of the rivers. We perceived no crocodiles in the *Raudal de Cariven*†; these animals seem to shun the noise of cataracts."

* The *toise* is rather more than a *fathom*, which is six English feet.

† The name of this part of the river, *Raudal* signifying a *cataract*.

At 9 o'clock they arrived opposite the mouth of the Meta, which, next to the Guaviare, is the largest tributary of the Orinoco, and is remarkable for the volume of its waters, their depth being sometimes 84 feet. The confluence of the two rivers presented an impressive scene. "Lonely rocks rise on the eastern bank. Blocks of granite, piled upon one another, appeared from afar like castles in ruins. Vast sandy shores keep the skirting of the forest at a distance from the river; but we discover in the horizon solitary palm-trees, backed by the sky and crowning the tops of the mountains."

Two hours were passed on a large rock in the middle of the river, the *Stone of Patience*, as it is called; because the canoes in going up were sometimes detained there two days, before they could be extricated from the whirlpool formed by it. Humboldt fixed his instruments on it and took altitudes of the sun. At night they slept on a sloping shelf of rock at the rapids of Tabajee: its crevices sheltered a swarm of bats. The cries of a jaguar very near them were heard for a long time; and were answered by the prolonged howlings of their dog. Humboldt waited the appearance of the stars in vain; "the sky was of a tremendous blackness; and the hoarse sound of the cascades of the Orinoco contrasted with the noise of the thunder that was rolling at a distance towards the forest."

During the 13th and 14th they continued the ascent of the river, and though they were proceeding further to the south, and by so doing arrived nearer to the equator, they found the heat diminish. The annoyance from the moschetoes increased nevertheless; at the mission of San Borja, which they visited on the 13th, they suffered most severely, being unable to speak or uncover the face without having the mouth and nose filled

with those insects. The extreme irritation of the skin made them fancy that the air was scorching; and they were prevented from bathing by the fear of the little *Caribe* fish before mentioned. The scenery of the Orinoco, as they advanced, assumed a more imposing and picturesque aspect. The crocodiles which they met with were all of an extraordinary size, being from twenty-two to twenty-four feet in length.

Their sufferings from the insects made them hurry off, however willing they were to stay. There were fewer insects in the strata of air just on the river, than near the edge of the forests. They at length arrived and spent a night at the little island of Panumana.

CHAPTER XV.

The Cataracts of the Orinoco—Marvellous narratives of the country above the cataracts—Panumana—Maladies—Regions round Atures and Maypures—Natural rafts of the Orinoco—Natural dikes—Increased intensity of nocturnal sounds—Atures—Propensities of animals—Hairy man of the woods—Plague of insects—Table-lands of the Andes free from the plague of moschetoes, &c.

“THE river of the Orinoco, in running from south to north, is crossed by a chain of granitic mountains. Twice impeded in its course, it turbulently breaks on the rocks, which form steps and transverse dikes. Nothing can be grander than the aspect of this spot. Neither the fall of the Tequendama” (near Santa Fe de Bogota), “nor the magnificent scenes of the Cordilleras, could weaken the impression produced upon my mind by the first view of the rapids of Atures and of Maypures. When you are so stationed that the eye can at once take in the long succession of cataracts, the im-

mense sheet of foam and vapours illumined by the rays of the setting sun, it seems as if you saw the whole river suspended over its bed. Scenes so astonishing must, for ages, have fixed the attention of the New World. When Diego de Todaz, Alfonso de Herera, and the intrepid Raleigh, anchored at the mouth of the Orinoco, they were informed by the Indians of the great cataracts, which the latter themselves had never visited, and which they even confounded with cascades further to the east. Whatever obstacle the force of vegetation under the torrid zone may be to the intercourse of nations, all that relates to the course of great rivers acquires a celebrity which extends to vast distances.”

The two celebrated cataracts of the Orinoco are formed by the passage of the river across the chain of mountains already described under the name of the *Cordillera of Parime**. They are called by the natives *Mapara* and *Quittuna*, the former being the northern or lower one. But the missionaries have styled them *Atures* and *Maypures*, from the names of the first tribes which they assembled in the nearest villages. On the coast of Caraccas, these two great cataracts are simply spoken of as the two *raudales*, or rapids, as if, compared with them, all the other falls of water were not deemed worthy of attention. The great cataracts are distant apart twelve leagues. They divide the missionary establishments of the province, formerly known as Spanish Guiana, into two unequal portions—viz., the missions of the Lower Orinoco, or such as are situated between the mouth of the river and the *raudal* of *Atures*, and the missions of the Upper Orinoco, or such as are situated between the *raudal* of *Maypures* and the mountains of *Duida*. The

* See page 107.

course of the Lower Orinoco is estimated at 260 nautical leagues; that of the Upper Orinoco at 167 leagues.

The country lying above the great cataracts is in a great measure an unknown land; it is partly flat, partly mountainous, and receives the confluent both of the Amazon and the Orinoco. "None of the missionaries," says Humboldt, "who have described the Orinoco before me, neither Gumilla, Gili, nor Caulin, had passed the raudal of Maypures. We found but three Christian establishments above the great cataracts, in an extent of more than 100 leagues; and these three establishments contained scarcely six or eight white persons, that is to say, persons of European races. We cannot be surprised that such a desert region should have been at all times the classical soil of fable and fairy visions. It is there that grave missionaries have placed nations with one eye in the forehead, the head of a dog, or the mouth below the stomach. It is there they have found all that the ancients relate of the Garamantes, of the Arimaspes, and of the Hyperboreans. It would be an error to suppose that these simple, and often rustic missionaries, had themselves invented all these exaggerated fictions; they derived them, in great part, from the recitals of the Indians. A fondness for narration prevails in the missions, as it does at sea, or in the East, and in every place where the mind wants amusement. A missionary, from his vocation, is not inclined to scepticism; he imprints on his memory what the natives have so often repeated to him; and after his return to Europe, and his restoration to the civilized world, he finds a compensation for his toil in the pleasure of creating astonishment by a recital of facts which he thinks he has collected, and by an animated description of remote

things. These tales of travellers and monks increase in improbability in proportion as you increase your distance from the forests of the Orinoco, and approach the coasts inhabited by the whites. When at Cumana, Nueva Barcelona, and other sea-ports which have frequent communication with the missions, you are reduced to silence by these few words, 'The fathers have seen it, but far above the cataracts.'"

They passed the night of the 15th of April on the island of Panumana. During the night, they sought the shelter of a deserted hut, the opening of which the Indians took care to barricade with planks, to prevent the intrusion of the jaguars and tigers, which were very numerous in that district. Some time before, an Indian, returning to his hut, at the close of the rainy season, found a tigress settled in it, with her two young. These animals had occupied the dwelling for several months, and could with difficulty be dislodged by the former master of the house. The jaguars, likewise, are fond of retiring to deserted ruins; so that it is more preferable to encamp in the open air, between two fires, than to seek shelter in uninhabited huts.

The village of Atures, or San Juan Nepomuceno de los Atures, was founded in 1748, by the Jesuit Francisco Gonzalez. It is the last of the missions in ascending the river, which owe their origin to the order of St. Ignatius, all those beyond it having been founded by the Franciscans. Humboldt says that the Orinoco appears to have flowed where the village now stands, and that, doubtless, the flat savannah surrounding it was once part of the bed of the river.

Our travellers found this mission in a deplorable condition. The number of the Indians had been for some time decreasing, and then amounted to only 47.

The causes of the depopulation were various; the chief of them are the repugnance of the Indians to the regulations of the missions, and the epidemic fevers which regularly prevail.

“What,” asks Humboldt, “are the causes of those fevers that prevail during a great part of the year in the villages of Atures and Maypures, around the two great cataracts of the Orinoco, and which render the spots so much to be dreaded by European travellers? They are violent heats, joined with the excessive humidity of the air, bad nutriment, and, if we may believe the natives, the pestilent exhalations that rise from the bare rocks of the *raudales*. These fevers of the Orinoco appeared to us to resemble altogether those that are felt every year between New Barcelona, La Guayra, and Porto Cabello, in the vicinity of the sea, and often degenerate into adynamic fevers. ‘I have had my little fever only eight months,’ said the good missionary of the Atures, who accompanied us to the Rio Negro, speaking of it as of an habitual evil, which it was easy to bear. The fits were violent, but of short duration. He was sometimes seized with them when lying along in the boat, under a shelter of branches of trees, sometimes when exposed to the burning rays of the sun on an open beach. These tertian agues are attended with great debility of the muscular system; yet we find poor ecclesiastics on the Orinoco who support, for several years, these *calenturitas* or *tercianas*: their effects are not so fatal as those which are experienced from fevers of much shorter duration in temperate climates.”

The pestilent exhalations here spoken of, as arising from the rocks of the cataracts, attracted the attention of Humboldt, who remarks that the circumstance is the more worthy of attention, on account of its connexion

with a fact which has been observed in several parts of the world, although it has not yet been sufficiently explained. The rocks, wherever they are periodically submersed, are smooth, and exhibit a black surface, as if they were coated with black lead. The crust is very thin, and consists mainly of oxide of iron and manganese. The same phenomenon has been observed at the cataracts of Syene in the Nile, and at those of the river Congo, and Humboldt supposes the deposit to be occasioned by a precipitation of substances chemically dissolved in the water, and not by an efflorescence of matters contained in the rocks themselves. Our travellers were told that persons passing the night on those rocks had awakened in the morning with a violent paroxysm of fever; and so strong is the conviction of the unwholesome influence of such rocks generally, that the Jesuits have on several occasions removed their establishments to a distance from them. Without entirely crediting what was said on the subject, our travellers took care to avoid the black rocks at night. Humboldt thinks that the danger of reposing on them may arise from the heat which they retain during the night, and which he found to be 20° above that of the air. In the day-time their temperature exceeded 118° , and they emitted a stifling heat. Instead, then, of noxious exhalations from these rocks causing the insalubrity, it may, in Humboldt's opinion, be referred to the accumulated and radiated heat, the humid atmosphere, and the want of a free circulation of air; for, in this neighbourhood, he tells us, no breath of wind ever agitates the foliage. The characteristic of these equatorial regions is grandeur and repose, whilst hurricanes and tempests belong to islands, to deserts destitute of plants, and to those spots where parts of the atmosphere repose upon

surfaces from which the radiation of heat is very various.

The scenery in the vicinity of Atures is very beautiful, the landscape varying at every step, so that we find united in a small space all that is most rude and gloomy in nature, with an open country, and lovely pastoral scenery. To the west of the village rises a pyramidal mountain, called the Peak of Uniana, to the height of nearly 3200 feet above the level of the plain in which it stands. "The savannahs of Atures," says Humboldt, "covered with slender plants and grasses, are real meadows, resembling those of Europe; they are never inundated by the rivers, and seem to wait to be ploughed by the hand of man. Notwithstanding their extent, they do not display the monotony of our plains; they surround groups of rocks and blocks of granite piled on one another. On the very borders of these plains and this open country you find glens scarcely lighted by the rays of the setting sun, and gulleys where the humid soil, loaded with arums, heliconias, and lianas, manifests at every step the wild fecundity of nature. Everywhere, just rising above the earth, appear those shelves of granite, completely bare, that I described at Carichana, and which I have seen nowhere, in the ancient world, of such prodigious breadth as in the valley of the Orinoco. Where springs gush from the bosom of these rocks, verrucarias, psoras, and lichens, are fixed on the decomposed granite, and have there accumulated mould. Little euphorbias, peperomias, and other succulent plants, have taken the place of the cryptogamous tribes; and evergreen shrubs, rhexias, and purple-flowered melastomas, form verdant isles amid desert and rocky plains. We are never wearied of repeating, that the

distribution of these spots, the clusters of small trees with coriaceous and shining leaves scattered in the savannahs, the limpid rills that dig themselves a channel across the rocks, and wind alternately through fertile places and over bare shelves of granite, everything here recalls to mind what our gardens and plantations contain, most picturesque and lovely. We seem to recognise the industry of man and the traces of cultivation amid the wildness of the scenery.

“But it is not the disposition of the ground that immediately skirts the mission of Atures which alone gives the landscape so remarkable a physiognomy: the lofty mountains, that bound the horizon on every side, contribute to it also by their form and the nature of their vegetation. These mountains are in general 700 or 800 feet in height above the surrounding plains. Their summits are rounded, as for the most part in granitic mountains, and covered with a thick forest of the laurel tribe. Clusters of palm-trees, the leaves of which, curled like feathers, rise majestically at an angle of 70 degrees, are dispersed amid trees with horizontal branches; and their bare trunks, like columns of 100 or 120 feet high, shoot up into the air, and appearing distinctly against the azure vault of the sky, ‘resemble a forest planted upon another forest.’ When, as the moon was going down behind the mountains of Uniana, her reddish disk was hidden behind the pinnated foliage of the palm-trees, and again appeared in the aerial zone that separates the two forests, I thought myself transported for a few moments to the hermitage of the old man, which M. Bernardin de St. Pierre has described as one of the most delicious scenes of the Isle of Bourbon, and I felt how much the mien of the plants, and their groupings, resembled each

other in the two worlds. In describing a small spot of land in an island of the Indian Ocean, the inimitable author of *Paul and Virginia* has sketched the vast picture of the landscape of the tropics. He knew how to paint nature, not because he had studied it scientifically, but because he felt it in all its harmonious analogies of forms, colours, and interior powers."

From its mouth to the distance of 260 leagues the navigation of the Orinoco is not impeded. There are shoals and eddies near Muitaco, in a cove which bears the name of the *Mouth of Hell*, and there are rapids near Carichana and San Borja; but in all these places the river is never barred entirely across, a channel being left by which boats can pass up and down. For these 260 leagues travellers are exposed to no other danger than that arising from the natural rafts, which are formed of trees uprooted by the river. "Wo to the canoes which, during the night, strike against these rafts of wood interwoven with lianas! Covered with aquatic plants, they resemble here, as in the Mississippi, floating meadows, the *chinampas* (floating gardens) of the Mexican lakes. The Indians, to surprise their enemies, bring together several canoes, fasten them to each other with cords, and cover them with grass and branches, to imitate this assemblage of trunks of trees, which the Orinoco sweeps along in its *thalweg*, or middle current. The Caribs are accused of having excelled in the use of this artifice; at present the Spanish smugglers in the neighbourhood of Angostura have recourse to the same expedient to escape the vigilance of the custom-house officers."

The great cataracts of Atures and Maypures form the first complete obstruction to the navigation of the Orinoco. The general aspect of these two bars, extending

from one bank to the other, is similar; each is composed of innumerable islands, dikes of rocks, and blocks of granite, piled on one another, and covered with palm-trees, "among which one of the greatest rivers of the New World chafes in foam." The northernmost of the great cataracts, or that of Atures, is the only one bounded on each side by lofty mountains. The river is there deeply enclosed by almost inaccessible banks. It was only in a very few spots that they could enter into the Orinoco to bathe between two cataracts, in creeks where the waters have little velocity. Persons who have dwelt in the Alps, the Pyrenees, or even the Cordilleras, so celebrated for the fractures and vestiges of destruction which they display at every step, can scarcely figure to themselves, from a simple narration, the state of the bed of the river. It is traversed, in an extent of more than five miles, by innumerable dikes of rocks, that form so many natural dams. The space between these rocky dikes is filled with islands of different dimensions; some hilly, and 200 or 300 toises in length; others small, low, and like simple shoals. These islands divide the river into a number of torrents, that boil up as they break against the rocks; they are all furnished with *jaguas* and *cucuritos*, with plummy leaves, and seem a mass of palm-trees, rising amid the foaming surface of the waters. The Indians, to whom the boats are entrusted to be passed empty across the *raudales*, distinguish every shelf and every rock by a particular name. The river is everywhere engulfed in caverns, and in one of these caverns we heard the water roll over our heads, and beneath our feet at the same time. The Orinoco seems divided into a multitude of arms or torrents, each of which seeks to force a passage through the rocks. We were struck

with the little water to be seen in the bed of the river, the frequency of subterraneous falls, and the tumult of the waters breaking on the rocks in foam.

When the dikes, or natural dams, are only two or three feet high, the Indians venture to descend them in boats. In going up the stream, they swim on before, and after many vain efforts, succeed in fixing a rope to one of the points of rock that crown the dike, and then draw the boat up. The boat, during this operation, often fills with water; at other times it is stove against the rocks, and the Indians, with their bodies bruised and bleeding, extricate themselves with difficulty from the eddies, and swim to the nearest island. When the rocky barriers are very high, and entirely bar the river, light boats are drawn upon rollers along the shore; but this operation is seldom necessary when the water is high. "We cannot," says Humboldt, "speak of the cataracts of the Orinoco without recalling to mind the mode formerly adopted for descending the cataracts of the Nile, of which Seneca has left us a description, probably more poetical than accurate. I shall only cite the passage which paints with fidelity what may be seen every day at Atures, Maypures, and in some *pongos* of the Amazons:—'Two men embark in a small boat; one steers, and the other empties it as it fills with water. Long buffeted by the rapids, the whirlwinds, and contrary currents, they pass through the narrowest channels, avoid the shoals, and rush down the whole river, guiding the course of the boat in its accelerated fall.'"

Humboldt was surprised to find that, with all the whirling and foaming and tumultuous movement of the waters of the rapids, the height of the fall on the whole length of the cataracts, did not exceed thirty feet perpendicular. He thinks it probable that a considerable

portion of the water passes into subterranean cavities. The roar of the cataracts is audible at the distance of more than three miles; "when this noise is heard in the plain surrounding the mission, at the distance of more than a league, you seem to be near a coast skirted by reefs and breakers." This noise, which "gives an inexpressible charm to these solitudes," is three times as loud by night as by day; and what, asks Humboldt, "can be the cause of this increased intensity of sound where nothing seemsto interrupt the silence of nature?" It is an old and very general observation, that sounds, and particularly those produced by rushing water, are heard with more distinctness and at greater distances by night than by day; yet the day is hotter than the night, and the velocity of sound decreases with the decrease of temperature. The intensity of sound likewise is diminished by a wind blowing contrary to the direction of such sound; yet this cause of diminution, if it could operate at all in this calm region, could only operate in the night, as no breeze is ever felt till after sunset.

"It may be thought," says Humboldt, "that even in places not inhabited by men, the hum of insects, the song of birds, the rustling of leaves agitated by the feeblest winds, occasion during the day a confused noise, which we perceive the less because it is uniform, and constantly strikes the ear. Now this noise, however slightly perceptible it may be, may diminish the intensity of a louder noise; and this diminution may cease, if during the calm of the night the song of birds, the hum of insects, and the action of the wind upon the leaves be interrupted. But this reasoning, even admitting its justness, can scarcely be applied to the forests of the Orinoco, where the air is constantly filled by an innu-

merable quantity of moschetoës, where the hum of insects is much louder by night than by day, and where the breeze, if ever it be felt, blows only after sunset."

The opinion entertained by Humboldt himself is this,—that the presence of the sun acts upon the propagation and intensity of sound by the obstacle presented by currents of air of different density, and the partial undulations of the atmosphere caused by the unequal heating of different parts of the soil; that the air, being crossed in every direction by small currents of hotter air, the sonorous undulation is divided where the density of the medium changes abruptly; that partial echoes are thus formed which weaken the sound, because one of the streams turns back on itself; that little movements may thus "ride over each other;" and that, in short, the unequal density of the air, under the influence of the sun, impedes and weakens sound in the day. In the night, this cause being removed, a great difference is perceptible.

The Indians at Atures consisted of two different tribes—the Guahiboes, a dirty and disgusting people, proud of their savage independence, averse to fixed habitations and regular labour, and very aptly styled by the missionaries *Indios Andantes*, or wandering Indians; and the Macoes or Salivas, a mild and tranquil people, disposed to agriculture, and capable of being brought under discipline without much difficulty. The idleness of the Indians exposes them often to the greatest privations; their support is principally derived from the cassava. When the Jesuits ruled here, maize, French beans, and other European vegetables, were cultivated; and sweet oranges and tamarinds were planted round the village. But at the time of Humboldt's visit the cultivation of maize was entirely neglected; and a few

trunks of the orange and tamarind trees choked in the forests were all that was left of the industrious activity of the first missionaries. Formerly, too, cows and horses abounded; but these had entirely disappeared, and the Indians talked of horned cattle as a race that was wholly lost. Many of the cattle had been devoured by the jaguars, and many had died of wounds inflicted by the bats of the cataracts, which are smaller but far bolder than those of the Llanos. The jaguars were considered less dangerous to cattle than these bats; yet so hardy and numerous were the jaguars at Atures, that they used to come into the village and devour the pigs of the poor Indians. The missionary related a very striking instance of familiarity displayed by one of these animals, generally so remarkable for their ferocity.

“Some months,” says Humboldt, “before our arrival, a jaguar, which was thought to be young, though of a large size, had wounded a child in playing with him; I use confidently this expression, which may seem strange, having on the spot verified facts which are not without interest in the history of the manners of animals. Two Indian children, a boy and a girl, about eight or nine years of age, were seated on the grass near the village of Atures, in the middle of a savannah, which we have often traversed. At two o’clock in the afternoon, a jaguar issued from the forest, and approached the children, bounding around them; sometimes he hid himself in the high grass, sometimes he sprang forward, his back bent, his head hung down, in the manner of our cats. The little boy, ignorant of his danger, seemed to be sensible of it only when the jaguar with one of his paws gave him some blows on the head. These blows, at first slight, became ruder and ruder; the claws of the jaguar wounded the child, and the blood flowed with

violence, the little girl then took a branch of a tree, struck the animal, and it fled from her. The Indians ran up at the cries of the children, and saw the jaguar, which retired bounding, without making the least show of resistance."

Our travellers saw the little boy, who appeared lively and intelligent. The jaguar's claws had taken away the skin from the lower part of the forehead; and there was a second scar at the top of the head. "What," asks our author, "meant this fit of playfulness in an animal which, although not difficult to be tamed in our menageries, is always so ferocious and cruel in the state of freedom? If we choose to admit that, being sure of its prey, it played with the young Indian as the domestic cat plays with a bird, the wings of which have been clipped, how can we account for the forbearance of a large jaguar when pursued by a little girl? If the jaguar was not pressed by hunger, why should it have gone up to the children? There are mysteries in the affections and hatred of animals. We have seen lions kill three or four dogs, which were put into their cage, and instantly caress another which had the courage to seize the royal beast by the mane. Man is ignorant of the sources of these instincts. It would seem that weakness inspires more interest, the more confiding it is."

It was among the cataracts that our travellers began to hear of "the hairy man of the woods," who has the reputation of carrying off women, building huts, and eating human flesh. Both the missionaries and the natives firmly believe in the existence of this *anthropomorphous*, or "man-shaped" animal; they name it *vasitri*, or the great devil, and hold it in singular dread. One of the Jesuits gravely relates the history of a lady who

lived with a vasitri for several years in great domestic harmony; she found him, she said, kind and attentive, but was induced to request some hunters to take her back to society "because she and her children were tired of living so far from the church and the sacraments." The existence of a wild man of the woods is commonly believed in throughout the equatorial regions of the old and new world. "This fable," says Humboldt, "which the missionaries, the European planters, and the negroes of Africa, have no doubt embellished with many features taken from the description of the manners of the ourang-outang, the gibbon, the jocko or chimpanzee, and the pongo, pursued us for years from the northern to the southern hemisphere; and we were everywhere blamed, in the most cultivated class of society, for being the only persons to doubt the existence of the great anthropomorphous monkey of America." He thinks it possible that the original of the fable may exist in the person of one of those large bears, the footsteps of which resemble those of a man, and which is believed in every country to attack women; and remarking that all articles of popular belief, even the most absurd in appearance, rest in real but ill-observed facts, he recommends that future travellers should continue their researches on "the hairy man of the woods," and examine whether some unknown species of bear, or some very rare monkey, may not have given rise to these singular tales.

The greatest inconvenience which our travellers suffered at Atures, as indeed throughout the voyage on the Orinoco, was the torment of insects. Persons who have not navigated the great rivers of Equinoctial America, the Orinoco and the Rio Magdalena, for example, can hardly conceive, our traveller tells us, how uninter-rupt-

edly, and at every instant of life, you may be tormented by insects flying in the air, and how a multitude of these little animals may render vast regions almost uninhabitable. "However accustomed you may be to endure pain without complaint, however lively an interest you may take in the object of your researches, it is impossible not to be constantly disturbed by the moschetoës, zancudoës, jejens, and tempraneroës, that cover the face and hands, pierce the clothes with their long sucker in the shape of a needle, and getting into the mouth and nostrils, set you coughing and sneezing whenever you attempt to speak in the open air." The *plaga de las moscas*, or plague of the flies, affords an inexhaustible subject of conversation in the missions; and the first questions asked on a morning salutation, are "How did you find the zancudoës during the night? How are we to-day for the moschetoës?"

The rage with which they attack men is remarkable; and Humboldt observes, that this voracity, the appetite for blood, seems surprising, in little insects which live on vegetable juices, and in a country almost uninhabited. "What would these animals eat if we did not pass this way?" say the Creoles, in going through the countries where there are only scaly-backed crocodiles and hairy-hided monkeys, both secure in their natural covering. It is amusing to find the missionaries disputing on the size and voracity of the moschetoës at different parts of the same river. "How I pity your situation!" said the missionary of the Raudales to the missionary of Cassiquiare, who accompanied our travellers, "you are alone like me in this country of tigers and monkeys; with you fish is still more rare, and the heat more violent; but as for my flies, I can boast that with one of mine I could beat three of yours."

Humboldt says, that as far up as the strait of Baraguan the traveller suffers from the sting of insects, but can easily bear it; but beyond that strait the scene instantly changes, and there is no longer any repose for him. If he has any poetical remembrance of Dante, he will think he has entered the *Citta dolente*, or city of mourning; and fancy that he reads on the granite rocks of Baraguan those lines of Dante's in which he introduces the *genti dolorose*, or sorrowful people,

We have come to the place, of which I have told thee,
That thou shalt behold the sorrowful people*.

From the surface of the ground to the height of fifteen or twenty feet the air is filled with venomous insects, like a condensed vapour. At San Borja, the suffering is severe; but at Atures, and above all at Maypures, it may be said to obtain its maximum. "I doubt," says Humboldt, "whether there be a country upon earth where man is exposed to more cruel torments in the rainy season. Having passed the fifth degree of latitude you are somewhat less stung; but on the Upper Orinoco the stings are more painful, because the heat and the absolute want of wind render the air more burning and more irritating in its contact with the skin."

"How comfortable must people be in the Moon!" said an Indian to a Jesuit missionary: "she looks so beautiful and so clear, that she must be free from moschetoes." These words, observes Humboldt, which denote the infancy of a people, are very remarkable. "The satellite of the earth is everywhere to the American savage the abode of the blessed, the country of abundance. The Esquimaux, who counts among his riches a plank, or a

* See DANTE'S 3rd Canto *Dell' Inferno*, v. 16 and 17.

trunk of a tree thrown by the currents on a coast destitute of vegetation, sees in the moon plains covered with forests; the Indian of the forests of the Orinoco there beholds open savannahs, where the inhabitants are never stung by moschettoes."

What appeared to our travellers very remarkable, and that which is a fact well known to all the missionaries, is that the different species of these noxious insects do not associate together, and all sting their unfortunate victims at once; but that at different hours of the day you are stung by different and distinct species. "Every time that the scene changes, and, to use the simple expression of the missionaries, other insects 'mount guard,' you have a few minutes, often a quarter of an hour, of repose. The insects that disappear have not their places instantly supplied in equal number by their successors." From half-past six in the morning till five in the afternoon the air is filled with moschettoes; their sting is very painful, and wherever their proboscis pierces the skin, it gives rise to a little reddish brown spot, containing extravasated and coagulated blood. An hour before sunset a species of small gnats called *tempraneroes*, (because they appear at so *early* an hour,) take the place of the moschettoes; and then disappear between six and seven in the evening. "After a few minutes' repose, you feel yourself stung by *zancudoes*, another species of gnat with very long legs. The zancudo, the proboscis of which contains a sharp-pointed sucker, causes the most acute pain, and a swelling that remains several weeks. Its hum resembles that of our gnats in Europe, but is louder and more prolonged. The Indians pretend to distinguish by their song the zancudoes and the *tempraneroes*; the latter of which are real *twilight in-*

sects while the zancudoes are most frequently *nocturnal insects*, and disappear towards sunrise."

These insects attack both natives and Europeans, but their stings produce different effects in the two races. "The same venomous liquid deposited in the skin of a copper-coloured man of Indian race, and in that of a white man newly landed, causes no swelling to the former, while on the latter it produces hard blisters greatly inflamed and painful for several days." The Indians suffer at the moment of being stung, but less severely than the whites. "Near Maypures," says Humboldt, "we saw some young Indians seated in a circle and rubbing cruelly each other's backs with the bark of trees dried at the fire. Indian women were occupied, with a degree of patience of which the copper-coloured race alone are capable, in extirpating, by means of a sharp bone, the little mass of coagulated blood which forms the centre of every sting, and gives the skin a speckled appearance." Whites, born in Equinoctial America, and Europeans who have long dwelt in the missions, suffer much more than the Indians, but infinitely less than Europeans newly arrived.

"In proportion as you ascend the table-land of the Andes these evils disappear. Man breathes a fresh and pure air. These insects no more disturb the labours of the day or the slumbers of the night; documents can be collected in archives without our having to complain of the voracity of the termites. The moschetoës are no longer feared at two hundred toises of height; and the termites, still very frequent at three hundred toises of elevation, become very rare at Mexico, Santa Fe de Bogota, and Quito. In these great capitals, situate on the back of the Cordilleras, we find libraries and

archives that the enlightened zeal of the inhabitants augments from day to day. These circumstances, which I here only indicate, are combined with others that insure a moral preponderance to the alpine region over the lower regions of the torrid zone. If we admit, agreeably to the ancient traditions collected in both the old and new worlds, that, at the time of the catastrophe which preceded the renewal of our species, man descended from the mountains into the plains, we may admit, with still greater confidence, that these mountains, the cradle of so many various nations, will for ever remain the centre of human civilization in the torrid zone. From their fertile and temperate tablelands—from these islets scattered in the aërial ocean—knowledge and the blessings of social institutions will be spread over the vast forests that extend to the foot of the Andes, and are inhabited in our days by tribes whom the very wealth of nature has retained in indolence.”

CHAPTER XVI.

Departure from Atures—Cataract of Maypures—Region beyond the Great Cataracts—Black Waters—Arrival at San Fernando de Atabapo—Bats of Aricagua.

ON the 17th of April the travellers quitted Atures, and after a march of three hours reached the point, to which their boat had been previously conducted through the rapids. Continuing their ascent of the river, they arrived by nightfall on the 19th at the port of Maypures; a storm had overtaken them on the voyage, and they were wet to the skin: as the rain ceased, the *zancudo*s re-appeared with that voracity which these insects display immediately after a storm. To reach

the village of Maypures required a journey of two hours. "My fellow-travellers," says Humboldt, "were uncertain whether we ought to take our station in the port, or proceed on our way on foot, in spite of the darkness of the night. Father Zea, who is the missionary of the two *raudales*, was determined to reach his home. He had caused the building of a large two-storied house to be begun by the Indians of the mission. 'You will there find,' he said, with simplicity, 'the same conveniences as in the open air; I have not a bench, not a table, but you will not suffer so much from the flies, which are less troublesome in the mission than on the banks of the river.' We followed the counsel of the missionary. He caused torches of copal to be lighted; these are tubes of three inches in diameter filled with copal resin. We walked at first on beds of rocks, bare and slippery; and then entered a thick grove of palm-trees. We were twice obliged to pass a stream on trunks of trees hewn down. The torches, being formed on a strange principle, the ligneous wick surrounding the resin, yielded more smoke than light, and were easily extinguished. Our fellow-traveller, Don Nicolas Soto, lost his balance in crossing the marsh on a round trunk. We were at first very uneasy on his account, not knowing from what height he had fallen; but happily the gully was not deep and he received no hurt. The Indian pilot, who expressed himself with some facility in Spanish, did not fail to talk to us of the snakes and the water-serpents, and the tigers, by which we might be attacked. Such conversations are matters of course, when you travel at night with the natives. By intimidating the European traveller, the Indians believe that they shall render themselves more necessary, and gain the confidence of the

stranger. The rudest inhabitant of the missions understands the deceptions, which everywhere arise from the relations between men of unequal fortune and civilization. Under the absolute and sometimes vexatious government of the monks, he seeks to ameliorate his condition by those little artifices, which are the weapons of childhood and of all physical and intellectual weakness."

The cataract of Maypures, or of Quittuna, as the Indians call it, is formed, in the same manner as that of Atures, by an archipelago of rocky islands, which fill the bed of the river for 3000 toises, and by rocky dikes which connect the islands together. One of these dikes, named the *leap of the Sardina*, is nearly nine feet high; and, being of considerable breadth, it forms a magnificent cascade.

"To take in at one view," says Humboldt, "the grand character of these stupendous scenes, the spectator must be stationed on the little mountain of Manimi, a granitic ridge that rises from the savannah, north of the church of the mission, and is itself only a continuation of the steps of which the dike, called the *raudalito* of Manimi, is composed. We often visited this mountain; for we were never weary of this astonishing spectacle, concealed in one of the most remote corners of the earth. Arrived at the summit of the rock, the eye suddenly takes in a sheet of foam extending a whole mile. Enormous masses of stone, black as iron, issue from its bosom. Some are paps, grouped in pairs, like basaltic hills; others resemble towers, strong castles, and ruined buildings. Their gloomy tint contrasts with the silvery splendour of the foam. Every rock, every islet, is covered with vigorous trees collected in clusters. At the foot of those

paps, far as the eye can reach, a thick vapour is suspended over the river, and through this whitish fog the tops of the lofty palm-trees shoot up. The leafy plume of this palm-tree has a brilliant lustre, and rises almost straight toward the sky. At every hour of the day the sheet of foam displays different aspects. Sometimes the hilly islands and the palm-trees project their broad shadows, sometimes the rays of the setting sun are refracted on the humid cloud that shrouds the cataract. Coloured arcs are formed, and vanish and appear again alternately; light spirits of the air, their masses wave above the plain.

“Such is the character of the landscape discovered from the top of the mountain of Manimi, which no traveller has yet described. I do not hesitate to repeat that neither time, nor the view of the Cordilleras, nor any abode in the temperate valleys of Mexico, has effaced from my mind the powerful impression of the aspect of the cataracts. When I read a description of those places in India, which are embellished by running waters and a vigorous vegetation, my imagination retraces a sea of foam and palm-trees, the tops of which rise above a stratum of vapour. The majestic scenes of nature, like the sublime works of poetry and the arts, leave remembrances which are continually being awakened, and which, through the whole of life, mingle with all our feelings of what is grand and beautiful. The calm of the atmosphere and the tumultuous movement of the waters produce a contrast peculiar to this zone. Here no breath of wind ever agitates the foliage; no cloud veils the splendour of the azure vault of heaven; a great mass of light is diffused in the air; the earth is strewn with plants with glossy leaves; and the bed of the river extends far as the eye can reach.

This appearance surprises the traveller born in the north of Europe. The idea of wild scenery, of a torrent rushing from rock to rock, is linked in his imagination with that of a climate where the noise of the tempest is mingled with the sound of the cataracts; and where, on a gloomy and misty day, sweeping clouds seem to descend into the valley and rest upon the tops of pines. The landscape of the tropics in the low regions of the continents has something of greatness and repose even where one of the elements is struggling with invincible obstacles."

After a stay of two days and a half at the village of Maypures, our travellers again embarked on the Orinoco, at two o'clock in the afternoon of the 21st. Their canoe had been much damaged in passing the cataracts, by the shoals, and through the carelessness of the Indians; but still greater dangers, as Humboldt observes, awaited it. It was to be dragged overland, across an isthmus of 36,000 feet, from the Rio Tuamini to the Rio Negro, to go up by the Cassiquiare to the Orinoco, and to repass the two raudales.

Entering the uninhabited regions beyond the great cataracts, they felt as if they had "reached a new world, and overstepped the barriers which nature seems to have raised between the civilized countries of the coast, and the savage and unknown interior." On the 22nd they landed at the mouth of the Rio Vichada or Visata, one of the affluents of the Orinoco, in order to examine the plants of the neighbourhood. The scenery was of a very singular character; the forest was thin, and over the plain innumerable rocks of granite rose to the height of 15 or 20 feet, in the form of massy prisms, ruined pillars, and solitary towers, sometimes shaded by the trees of the forests, sometimes having their summits crowned with palms. Amid this picturesque scene, M.

Bonpland was fortunate enough to find several specimens of the *laurus cinnamomoides*, a very aromatic species of cinnamon. Humboldt observes that the barks and aromatic fruits of the new continent would have become important objects of trade if Europe, at the period of the discovery of America, had not already been accustomed to the spices and aromatics of India. The cinnamon of the Orinoco is, however, less aromatic than that of Ceylon, and would still be so, even if dried and prepared by similar processes.

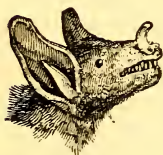
The Rio Vichada appeared to Humboldt to be, next to the Meta and the Guaviare, the most considerable river joining the Orinoco from the west; but for the previous forty years no European had navigated it, and our traveller could learn nothing of its sources. The vast space of ground lying to the west of the Orinoco, between the Meta and the Guaviare, is altogether unknown for the distance of a league from the banks; but it is believed to be inhabited by wild Indians of the Chiricoa tribe, "who fortunately build no boats." Formerly, when the Caribees, and their enemies the Cabres, traversed these regions with their little fleets of rafts and canoes, it would have been imprudent to have passed the night near the mouth of a river running from the west; but the settlement of the Europeans has caused the independent Indians to retire from the banks of the Upper Orinoco. Such was the solitude of these regions, that, during a course of 180 leagues, our travellers did not meet one single boat.

The night of the 22nd was passed at the mouth of the Rio Zama, another considerable river, as little known as the Vichada. At this point our travellers reached a class of rivers which Humboldt considers to merit great attention. The Zama and other rivers, such as the





Vampyre Bat.



Heads of Bats.

Mataveni, the Atabapo, the Tuamini, the Temi, and the Guainia, are called *aguas negras*, literally "black waters;" their waters, when seen in a large body, appearing brown, like coffee, or of a greenish black. Nevertheless, these waters are beautifully clear, and very agreeable to the taste, and when the least breath of wind agitates the surface of the *black rivers*, they assume a fine grass-green hue, like that of the lakes of Switzerland. These phenomena are so striking, that the Indians everywhere distinguish the waters into black and white. "The former," says Humboldt, "have often served me for an artificial horizon; they reflect the images of the stars with admirable clearness." He is unable to account for the colour, but suggests that it arises from "a mixture of carbon and hydrogen, in an extractive vegetable matter."

Passing the mouths of several rivers, our travellers at length came to the Guaviare, and entering that branch of the Orinoco, forsook the main stream, for a purpose which we shall presently explain. It was on the 24th that they entered the mouth of the Guaviare; they passed, soon afterwards, the point where the Rio Atabapo joins that river, and reaching the mission of San Fernando de Atabapo soon after midnight, were lodged as usual at the missionary's house, the "convent," as it is called.

The night of the 23rd was spent near a rock called Aricagua, from the clefts of which an innumerable quantity of bats issued, and hovered around their hammocks. The number of these animals, which are very injurious to cattle, is particularly augmented in years of drought. In the province of Ciara, in Brazil, they cause such destruction among the cows, that rich farmers are sometimes reduced by them to indigence. These are called *vampyre-bats*.

CHAPTER XVII.

Departure from the Orinoco, and ascent of the river Atabapo—Mission of San Balthasar—Rock of the Mother; origin of its name—Connexion of the Orinoco with the river Amazon—Dapicho—They embark on the Pimichin stream.

“DURING the night,” says Humboldt, “we had left, almost unperceived, the waters of the Orinoco, and at sunrise found ourselves as if transported to a new country, on the banks of a river the name of which we had scarcely ever heard pronounced, and which was to conduct us, by the *portage* of Pimichin, to the Rio Negro, on the frontiers of Brazil. ‘You will ascend,’ said the president of the missions, who resides at San Fernando, ‘first the Atabapo, then the Temi, and finally the Tuamini. When the force of the current of the *black waters* hinders you from advancing, you will be conducted out of the bed of the river through forests which you will find inundated. Two monks only are settled in those desert places between the Orinoco and the Rio Negro; but at Javita you will be furnished with the means of having your canoe drawn overland, in the course of four days, to Canno Pimichin. If it be not broken to pieces, you will descend the Rio Negro, (from north-west to south-east,) as far as the little fort of San Carlos, without encountering any obstacle; you will ascend the Cassiquiare (from south to north), and then return to San Fernando in a month, descending the Upper Orinoco from east to west.’ Such was the plan which was traced for our navigation, and which we executed not without suffering, but without danger and with facility, in the space of thirty-three days.”

Our travellers began their ascent of the Atabapo from

San Fernando on the 26th. A remarkable change takes place on entering this river; the constitution of the atmosphere, the colour of the waters, and the form of the trees which cover the shore, all become different. The moschetoës no longer torture the traveller during the day, and the long-legged zancudoës become rare during the night, and even altogether disappear beyond San Fernando. The waters of the Orinoco are turbid, and loaded with earthy matter, and in the creeks, from the accumulation of dead crocodiles and other putrescent substances, diffuse an unpleasant smell. Our travellers were sometimes obliged to strain the water through a linen cloth before they could drink of it. On the other hand, the waters of the Atabapo are pure, destitute of smell, and agreeable to the taste: their colour is brownish by *reflected* light, and a pale yellow by *transmitted* light. The people call them "light," in contradistinction to the heavy and turbid waters of the Orinoco; and they are cooler, likewise, than the latter. Humboldt observes that, after having been compelled, during a whole year, to drink water at 80° or 82°, a lowering of a few degrees in the temperature produces a very agreeable sensation.

The extreme purity of the waters of the Atabapo, in common with the other black rivers, is shown by their limpidity, their transparency, and the clearness with which they reflect the images and colours of surrounding objects. The smallest fish are visible at the depth of twenty or thirty feet, and the bottom of the river may generally be perceived, exhibiting not a yellowish or brownish mud, but a sand of dazzling whiteness. "Nothing," says Humboldt, "can be compared to the beauty of the banks of the Atabapo. Loaded with plants, among which rise the palms, crowned with

leafy plumes, the banks are reflected in the waters, and the verdure of the reflected image seems to have the same vivid hue as the object itself directly seen; the surface of the fluid is so homogeneous, smooth, and destitute of that mixture of suspended sand and decomposed organic matter which roughens and streaks the surface of less limpid rivers."

"The river Atabapo," he adds, "displays everywhere a peculiar aspect; you see nothing of its real banks formed by flat lands, eight or ten feet high, and they are concealed by a row of palms, and small trees with slender trunks, the roots of which are bathed by the waters. There are many crocodiles from the point where you quit the Orinoco to the mission of San Fernando, but above the mission there are no longer any; we find then some *bavas*, a great many fresh-water dolphins, but no manatees. We also seek in vain on those banks the thick-nosed tapir, the araguates, or great howling monkeys, the zamuro vulture, and the crested pheasant known by the name of *guacharaca*. Enormous water-snakes, in shape resembling the boa, are unfortunately very common, and are dangerous to the Indians who bathe. We saw them almost from the first day swimming by the side of our canoe; they were at the most twelve or fourteen feet long. The jaguars of the banks of the Atabapo and the Temi are large and well fed; they are said however to be less daring than the jaguars of the Orinoco." The reader will observe in this last sentence that the latter is a consequence of the former.

On the 29th the travellers reached the mission of San Balthasar, or as the monks style it, *La divina pastora de Balthasar de Atabapo*. The name of Balthasar being that of an Indian chief, not of a Christian saint.

Here they lodged with a Catalan missionary, a lively and agreeable man, who had planted a good garden, in which the fig, the lemon, the persea, and the mammee, were growing together. The village was regularly built; and the Indian plantations seemed to be better cultivated than those on the Orinoco.

On the following day they continued to ascend the Atabapo as far as its junction with the Rio Temi; and as they approached the confluence, their attention was drawn to a granite mass rising on the western bank. It was called the *Rock of the Guahiba Woman*, or *Rock of the Mother*; and the cause of this singular denomination was afterwards explained to them in a melancholy narrative, which excited in their minds the most painful feelings. "If in these solitary scenes," exclaims Humboldt, "man scarcely leaves behind him any trace of his existence, it is doubly humiliating for an European to see perpetuated by the name of a rock,—by one of those imperishable monuments of nature,—the remembrance of the moral degradation of our species, and the contrast between the virtue of a savage and the barbarism of civilized man." The tale is connected with the system of "conquering souls"—the *conquista de almas*—already spoken of; it is thus related:—

"In 1797 the missionary of San Fernando had led his Indians to the banks of the Rio Guaviare, on one of those incursions which are prohibited alike by religion and the Spanish laws. They found in an Indian hut a Guahiba mother with three children, two of whom were still infants. They were occupied in preparing the flour of cassava. Resistance was impossible; the father was gone to fish, and the mother tried in vain to flee with her children. Scarcely had she reached the savannah, when she was seized by the Indians of the mission

who go to *hunt men*, like the whites and the negroes in Africa. The mother and her children were bound, and dragged to the bank of the river. The monk, seated in his boat, waited the issue of the expedition, of which he partook not the danger. Had the mother made too violent a resistance, the Indians would have killed her, for every thing is permitted when they go to the conquest of souls (*a la conquista espiritual*), and it is children in particular they seek to capture, in order to treat them in the mission as *poitos*, or slaves of the Christians. The prisoners were carried to San Fernando, in the hope that the mother would be unable to find her way back to her home by land. Far from those children who had accompanied their father on the day in which she had been carried off, this unhappy woman showed signs of the deepest despair. She attempted to take back to her family the children who had been snatched away by the missionary, and fled with them repeatedly from the village of San Fernando, but the Indians never failed to seize her anew; and the missionary, after having caused her to be mercilessly beaten, took the cruel resolution of separating the mother from the two children, who had been carried off with her. She was conveyed alone toward the missions of the Rio Negro: going up the Atabapo, slightly bound, she was seated at the bow of the boat, ignorant of the fate that awaited her; but she judged by the direction of the sun, that she was removing farther and farther from her hut and her native country. She succeeded in breaking her bonds, threw herself into the water, and swam to the left bank of the Atabapo. The current carried her to a shelf of rock, which bears her name to this day. She landed, and took shelter in the woods; but the president of the missions ordered the Indians to row to the shore, and fol-

low the traces of the Guahiba. In the evening she was brought back. Stretched upon the rock (*la Piedra de la Madre*), a cruel punishment was inflicted on her with those straps of manatee leather, which serve for whips in that country, and with which the alcades are always furnished. This unhappy woman, her hands tied behind her back with strong stalks of *mavacure*, was then dragged to the mission of Javita.

She was there thrown into one of the caravanseras that are called *Casa del Rey*. It was the rainy season, and the night was profoundly dark. Forests, till then believed to be impenetrable, separated the mission of Javita from that of San Fernando, which was 25 leagues distant in a straight line. No other path is known than that of the rivers; no man ever attempted to go by land from one village to another, were they only a few leagues apart. But such difficulties do not stop a mother who is separated from her children. Her children are at San Fernando de Atabapo; she must find them again; she must execute her project of delivering them from the hands of Christians, of bringing them back to their father on the banks of the Guaviare. She was carelessly guarded in the caravansera. Her arms being wounded, the Indians had loosened her bonds, unknown to the missionary and the alcades. She succeeded by the help of her teeth in breaking them entirely; disappeared during the night; and at the fourth rising sun, was seen at the mission of San Fernando, hovering around the hut where her children were confined. 'What that woman performed,' added the missionary who gave us this sad narrative, 'the most robust Indian would not have ventured to undertake. She traversed the woods at a season when the sky is constantly covered with clouds, and the sun

during whole days appears but for a few minutes. Did the course of the waters direct her way? The inundations of the rivers forced her to go far from the banks of the main stream, through the midst of the woods where the movement of the waters is almost imperceptible. How often must she have been stopped by the thorny lianas, that form a net-work around the trunks they entwine! How often must she have swum across the rivulets that run into the Atabapo! This unfortunate woman was asked how she had sustained herself during four days. She said, that exhausted with fatigue, she could find no other nourishment than those great black ants called *vachacos*, which climb the trees in long bands to suspend on them their resinous nests.' We pressed the missionary to tell us whether the Guahiba had peacefully enjoyed the happiness of remaining with her children, and if any repentance had followed this excess of cruelty. He would not satisfy our curiosity; but at our return from the Rio Negro we learnt that the Indian mother was not allowed time to cure her wounds, but was again separated from her children, and sent to one of the missions of the Upper Orinoco. There she died, refusing all nourishment, as the savages do in great calamities."

Quitting the stream of the Atabapo our travellers entered the Rio Temi, and ascended it as far as its junction with the Tuamini; then in like manner they quitted the Temi, and ascended the Tuamini as far as the mission of San Antonio de Javita, which they reached on the 1st of May. Here their voyage upon the Orinoco and its tributaries was for a time interrupted; and in this part of our narrative, it will be proper for us briefly to explain their design in quitting the main stream of the Orinoco in order to ascend its

tributaries, as well as their intentions with respect to their future course.

For some time previous to Humboldt's visit, geographers had possessed some vague information concerning a communication between the great river-system of the Amazon and that of the Orinoco: the fact of the connection was, however, by no means generally admitted; on the contrary, it was denied by many who considered that, because these two great rivers flowed in different directions, there must be a great mountain-barrier between them, from the opposite sides of which they respectively descended. It is now, however, well ascertained that great rivers flowing in opposite directions are often separated by very slight elevations; for instance, in North America, the Mississippi, and the other rivers flowing southward into the Gulf of Mexico, are separated by an inconsiderable ridge from the waters flowing into the Arctic Sea and toward the west. In like manner, so trifling is the elevation between the upper waters of the Orinoco and the Amazon, that they actually communicate; and the communication is effected thus: one of the greatest tributaries of the Amazon, namely, the Rio Negro, in its progress towards that river, throws off to the northward a branch called the Cassiquiare, which flows into the Orinoco. We have said that, previous to Humboldt's visit, it was a subject of dispute among geographers whether this communication existed; it was one of the main objects of his visit to settle the dispute. His obvious course would have been to ascend the main stream of the Orinoco until he reached the point where the Cassiquiare falls into it; then, tracing the Cassiquiare until he came to the Rio Negro, he would have settled the controversy, the Rio Negro being satisfactorily known

to be a branch of the Amazon. But a different course presented itself. The river-systems of the Orinoco and the Amazon approach very near to each other at one point; that is to say, those tributaries of the Orinoco up which we have already conducted our travellers are separated by only a narrow isthmus, as it were, from the Pimichin, a tributary of the Rio Negro, which is itself one of the branches of the Amazon. By ascending those tributaries of the Orinoco, and then crossing that isthmus to the Pimichin, the Rio Negro may be reached much sooner than by ascending the main stream of the Orinoco as high as the Cassiquiare, and then tracing the Cassiquiare to the Rio Negro.

It was with the view of reaching the Rio Negro by the shorter route here pointed out, that our travellers had quitted the main stream of the Orinoco, to ascend in succession its tributaries, the Atabapo, the Temi, and the Tuamini, until they reached the mission of Javita, on the last-named river. From hence it was their design to cross the intervening forests and embark on the Pimichin, which would conduct them into the Rio Negro; then to descend the Rio Negro till they came to its branch, the Cassiquiare, which would conduct them into the Orinoco; and finally to descend the Orinoco itself on their return to the coast.

Four days were occupied by the Indians in dragging the canoe on rollers across the "portage of Pimichin," as the little isthmus is called which separates the Tuamini from the Pimichin; or, in other words, which here separates the river-system of the Orinoco from that of the Amazon. During this time, the travellers remained at Javita; but the incessant rains impeded their usual researches, preventing Humboldt from making astronomical observations, and Bonpland from collecting

and drying specimens. The missionary told them that it sometimes rained without intermission for four or five months; and Humboldt actually found by measurement, that there fell in three hours on one day, as much rain as falls in Paris in three weeks.

At Javita our travellers obtained some information concerning a singular substance, named *dapicho* or *zapis*, resembling caoutchouc, or Indian rubber. The natives make it into balls for their games, cut it into cylinders for corks, and mould it into large masses for drumsticks. It is dug out of the earth pure from between the roots of two trees, one of which furnishes the common caoutchouc: in its natural state it is white corky, and brittle; but on being roasted it becomes black, and acquires all the properties of caoutchouc. Humboldt is inclined to think that it is produced by an extravasation of sap from the roots, masses of which were found two feet in diameter and four inches thick, at the distance of eight feet from the trunks.

On the 5th of May our travellers departed from Javita on foot to follow their canoe; and after passing through thick forests and fording numerous streams without suffering from the serpents, they reached a small farm on the Pimichin towards evening, and passed the night in a deserted hut, previously dispossessing and killing two large snakes. On the following morning a large viper was found beneath the jaguar-skin on which one of them had slept. This species of serpent is white on the belly, spotted with brown, and black on the back, and grows to the length of four or five feet. Humboldt remarks, that, if vipers and rattlesnakes had such a disposition to attack any one, as is usually supposed, the human race could not have resisted them in some parts of America, more particu-

larly on the banks of the Orinoco, and on the sides of the humid mountains of Choco.

At sunrise they embarked on the Pimichin, after ascertaining that the bottom of their canoe, though worn much thinner, had received no crack in the *portage*, or passage over-land. Following its winding and narrow channel for four hours and a half, they entered the Rio Negro. "The morning," says Humboldt, "was cool and beautiful. We had been confined thirty-six days in a narrow boat, so unstable, that it would have been upset by any person rising imprudently from his seat, without warning the rowers to preserve its balance by leaning on the opposite side. We had suffered severely from the sting of insects, but we had withstood the insalubrity of the climate; we had passed without accident the great number of falls of water, and bars, which impede the navigation of the rivers, and often render it more dangerous than long voyages by sea. After all we had endured, I may be permitted perhaps to speak of the satisfaction which we felt on having reached the tributaries of the Amazon,—in having passed the isthmus which separates two great systems of rivers, and in having attained a certainty of fulfilling the most important object of our journey,—that of determining by astronomical observations the course of that arm of the Orinoco which joins the Rio Negro, and whose existence had been alternately proved and denied for half a century. In proportion as we draw near to an object which we have long had in view, its interest seems to augment. The uninhabited banks of the Cassiquaire, covered with forests, without memorials of times past, then occupied my imagination, as do now the banks of the Euphrates or the Oxus, celebrated in the annals of civilized nations. In these inland regions of the New Continent we almost accus-

tomed ourselves to consider man as unessential to the order of nature. The earth is overloaded with plants, of which nothing impedes the development. An immense layer of mould evinces the uninterrupted action of the organic processes. The crocodiles and boas are masters of the river; the jaguar, pecari, dante, and monkeys of numerous species, traverse the forest without fear and without danger, residing there as in an ancient inheritance. This aspect of animated nature, in which man is nothing, has something in it strange and sad. To this we reconcile ourselves with difficulty on the ocean and amid the sands of Africa; though in these scenes where nothing recalls to mind our fields, our woods, and our streams, we are less astonished at the vast solitude through which we pass. Here, in a fertile country, adorned with eternal verdure, we seek in vain the traces of the power of man; we seem to be transported into a world different from that which gave us birth. These impressions are so much the more powerful in proportion as they are of longer duration. A soldier, who had spent his whole life in the missions of the Upper Orinoco, slept with us on the bank of the river. He was an intelligent man, who, during a calm and serene night, pressed me with questions on the magnitude of the stars, on the inhabitants of the moon, on a thousand subjects concerning which I was as ignorant as himself. Being unable by my answers to satisfy his curiosity, he said to me in a firm tone: ‘With respect to men, I believe that there are no more above than you would have found if you had gone by land from Javita to Cassiquiare. I think I see in the stars, as here, a plain covered with grass and a forest traversed by a river.’ These words depict the impression produced by the monotonous aspect of these solitary regions.”

CHAPTER XVIII.

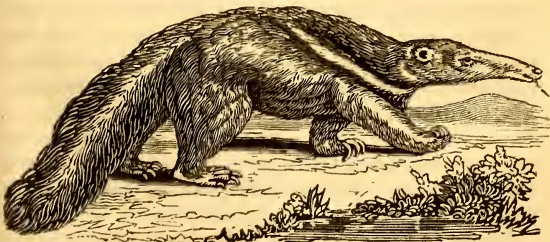
Voyage down the Rio Negro—Christian settlements—Ants—The Cassiquiare—Esmeralda—The Curare—They arrive again at San Fernando de Atabapo—Cavern of A taruipe—Earth-eating Indians—They reach Angostura, and set out for Cumana.

DESCENDING the Rio Negro, on the 6th and 7th of May, our travellers reached the mouth of the Cassiquiare; but instead of ascending it directly, they passed down the Rio Negro nine or ten miles further, in order to visit the military station of San Carlos del Rio Negro, on the borders of Brazil. After a stay of three days they retraced their course to the mouth of the Cassiquiare, and proceeded to ascend its stream, which was to conduct them once more into the Orinoco. They found its banks thickly covered with trees of the largest dimensions: the air was stagnant, hot, and humid, and the torment of the moschetoës augmented as they increased their distance from the black waters of the Rio Negro. During the twelve days which they passed on the Cassiquiare, they scarcely saw the sun or a star, so dense a fog hung over the forests on its borders.

The state of the Christian settlements on this river was deplorable; on the whole extent of its course, about fifty leagues, not 200 inhabitants existed. At Mandavaca they found a missionary, who had spent "twenty years of moschetoës in the forests of the Cassiquiare;" his legs were so spotted with the stings of insects, that the original whiteness of the skin could scarcely be perceived. He complained of his dreary solitude, and the sad necessity of witnessing the atrocious crimes of his flock, without being able to prevent or punish them: among other enormities he related that an In-

dian alcayde, or overseer, had a few years before eaten one of his wives, after having fattened her for the purpose. "You cannot imagine," he said, "all the perversity of this Indian family. You receive men of a new tribe into the village; they appear to be good, mild, and industrious: but suffer them to take part in an incursion to bring in the natives, and you can scarcely prevent them from murdering all they meet, and hiding some portion of the dead bodies."

The soil on the banks of the Cassiquiare is fertile; but innumerable swarms of ants and other insects destroy all that comes in their way. If a missionary wish to cultivate salad or any of the culinary plants of Europe, he sows the seeds in an old boat filled with mould, and suspends it between two trees, or places it on a scaffold. The ravages of the ants are counteracted in some degree by the voracious appetite of an animal—the ant-eater—peculiarly adapted by nature to lick them up by thousands, as his ordinary food. These animals are pretty generally distributed over all the warmer parts of South America. The low and swampy grounds, by the sides of streams and pools, or in the forests, are his favourite haunts.



Great Ant-Eater.

Towards the Orinoco the vegetation was found to be exceedingly luxuriant. The river no longer had any beach; thick palisades of tufted trees lined the banks, so that it appeared like a vast canal nearly 1300 feet in width, flowing between two enormous walls clothed with lianas and foliage. No openings could be discovered in these fences; and at night, the Indians had to clear with their hatchets a small spot for a resting-place. No human creature appeared in these forests. "Not five boats," says Humboldt, "pass annually by the Cassiquiare; and since we left Maypures, that is, for a whole month, we had not met one living soul on the rivers which we followed, except in the immediate neighbourhood of the missions."

On the 21st of May our travellers re-entered the Orinoco, three leagues below the mission of Esmeralda, the most solitary and remote Christian settlement on the Upper Orinoco. The site of the little hamlet is highly picturesque; the country around is lovely and fertile; and behind it rises, in the form of an amphitheatre, a group of granite mountains. The principal of them bears the name of Duida; it is 8500 feet high, and bare and stony on the summit; perpendicular on two sides, and on the others clothed with vast forests, it forms a magnificent object. Esmeralda had no resident missionary, being visited five or six times a year by a monk, living at the distance of fifty leagues. Not a cow or a horse was to be seen; the inhabitants cultivated only a little cassava and a few plantains, and their indolence often reduced them to the necessity of eating smoked monkey-hams, and pounded bones of fish as flour.

Esmeralda is celebrated, however, on the Orinoco, for its manufacture of the *curare*, a very active poison,

employed by the Indians in war and in the chase. It is prepared from the bark of a liana or creeper, called *bejuco de mavacure*, and is a common infusion concentrated by evaporation and thickened by the addition of a glutinous substance. Our travellers saw the process performed by an old Indian, who extolled the properties of the poison, observing that it was better than the *black powder* used by the white people; that he said, makes a noise,—the curare “kills silently.” Like some other vegetable poisons, however, it is fatal only when introduced directly into the blood; it may be tasted without danger, and, taken internally, it is considered by the natives to be an excellent stomachic. They always use it in hunting, the tips of their arrows being covered with it; and they maintain that the flesh of animals is always best when they have been killed by a poisoned arrow. The common mode of killing domestic fowls is by scratching the skin with one of these weapons; and the missionary who accompanied our travellers, used to have a live fowl and an arrow brought to his hammock every morning, not choosing to confide to any other person the important task of pricking it in the right place. A large bird pricked in the thigh died in two or three minutes; to kill a pig or a pecari sometimes took ten or twelve.

On the 23rd of May the travellers left the mission of Esmeralda, suffering from languor and weakness, caused by bad and scanty food, the torment of insects, and the inconveniences of a long voyage in a narrow and damp boat. They descended the Orinoco with the current; and as they passed between its deserted banks, they felt that “there was something melancholy and painful in a river, on which not even a fisherman’s canoe was seen.” On the 27th they reached San Fernando de Atabapo,

where a month before they had quitted the main stream of the Orinoco, to ascend its tributaries and make their way to the Rio Negro. From this point they retraced their former course, passed the great cataract of Maypures, and on the 31st, before sunset, they landed at the Puerto de la Expedicion, on the eastern bank of the river, for the purpose of visiting the cavern of Ataruipe, which is the sepulchre of a whole nation now extinct. Humboldt's account of this visit is extremely interesting. "We climbed," he says, "with difficulty, and not without some danger, a steep rock of granite, entirely bare. It would have been almost impossible to fix the foot on its smooth and sloping surface, if large crystals of feldspar, resisting decomposition, did not stand out from the rock, and furnish points of support. Scarcely had we attained the summit of the mountain, when we beheld with astonishment the singular aspect of the surrounding country. The foaming bed of the water is filled with an archipelago of islands, covered with palm-trees. Towards the west, on the left bank of the Orinoco, stretch the savannahs of the Meta and the Casanare. They resembled a sea of verdure, the misty horizon of which was illumined by the rays of the setting sun. Its orb, resembling a globe of fire suspended over the plain, and the solitary Peak of Uniana, which appeared more lofty from being wrapped in vapours that softened its outline, all contributed to augment the majesty of the scene. Near us, the eye looked down into a deep valley, enclosed on every side. Birds of prey and goat-suckers winged their lonely flight in this inaccessible circus. We found a pleasure in following with the eye their fleeting shadows, as they glided slowly over the flanks of the rock.

"A narrow ridge led us to a neighbouring mountain,

the rounded summit of which supported immense blocks of granite. These masses are more than forty or fifty feet in diameter; and their form is so perfectly spherical that, appearing to touch the soil only by a small number of points, it might be supposed, that, at the least shock of an earthquake, they would roll into the abyss. I do not remember to have seen, anywhere else, a similar phenomenon amid the decompositions of granitic soils. If the balls rested on a rock of a different nature, as it happens in the blocks of Jura, we might suppose that they had been rounded by the action of water, or thrown out by the force of an elastic fluid; but their position on the summit of a hill alike granitic makes it more probable that they owe their origin to the progressive decomposition of the rock.

“The most remote part of the valley is covered by a thick forest. In this shady and solitary spot, on the declivity of a steep mountain, the cavern of Ataruipe opens itself; it is less a cavern than a jutting rock, in which the waters have scooped a vast hollow, when, in the ancient revolutions of our planet, they attained that height. We soon reckoned in this tomb of a whole extinct tribe, near six hundred skeletons well preserved, and so regularly placed that it would have been difficult to make an error in their number. Every skeleton reposes in a sort of basket made of the petioles of the palm-tree. These baskets, which the natives call *mapires*, have the form of a square bag. Their size is proportioned to the age of the dead; there are some for infants cut off at the moment of their birth. We saw them from ten inches to three feet four inches long, the skeletons in them being bent together. They are all ranged near each other, and

are so entire that not a rib, or a phalanx, is wanting. The bones have been prepared in three different modes: either whitened by the air and the sun; dyed red with *onoto*, a colouring matter extracted from the *bixa orellana*; or, like real mummies, varnished with odorous resins, and enveloped in leaves of the heliconia, or of the plantain-tree. The Indians related to us that the fresh corpse is placed in damp ground, in order that the flesh may be consumed by degrees. Some months after, it is taken out, and the flesh remaining on the bones is scraped off with sharp stones. Several hordes in Guiana, still observe this custom. Earthen vases, half-baked, are found near the *mapires*, or baskets. They appear to contain the bones of the same family. The largest of these vases, or funeral urns, are three feet high, and five feet and a half long. Their colour is greenish grey, and their oval form is sufficiently pleasing to the eye. The handles are made in the shape of crocodiles or serpents, the edge is bordered with meanders, labyrinths, and real *grecques*, (Greek fashions,) in straight lines variously combined. Such paintings are found in every zone. The inhabitants of the little mission of Maypures still execute them on their commonest pottery; they decorate the bucklers of the Otaheiteans, the fishing implements of the Eskimoes, the walls of the Mexican palace of Mitla, and the vases of ancient Greece. Everywhere a rhythmic repetition of the same forms flatters the eye, as the cadenced repetition of sounds soothes the ear. Analogies founded on the internal nature of our feelings, on the natural dispositions of our intellect, are not calculated to throw light on the filiation and the ancient connexions of nations.

“We opened, to the great concern of our guides,

several mapires, for the purpose of attentively examining the form of the skulls. They all presented the characters of the American race,—two or three only approached the Caucasian form. We took several skulls, the skeleton of a child six or seven years old, and those of two full-grown men, of the nation of the Atures. All these bones, some painted red, others covered with odoriferous resins, were placed in the *mapires*, or baskets, already described. They formed nearly the whole lading of a mule; and, as we were aware of the superstitious aversion which the natives show towards dead bodies, after they have given them burial, we carefully covered the baskets with new mats. Unfortunately for us, the penetration of the Indians, and the extreme delicacy of their organs of smell, rendered our precautions useless. Wherever we stopped—in the Carib mission, in the midst of the Llanos, between Angostura and New Barcelona,—the natives collected round our mules to admire the monkeys which we had brought from the Orinoco. These good people had scarcely touched our baggage, when they predicted the approaching death of the beast of burden ‘that carried the dead.’ In vain we told them that they were deceived in their conjectures, that the panniers contained bones of crocodiles and manatees; they persisted in repeating that they smelt the resin which surrounded the skeletons, and that ‘they were some of their *old relatives*.’

“We withdrew in silence, from the cavern of Ataruipe. It was one of those calm and serene nights which are so common in the torrid zone. The stars shone with a mild and planetary light. Their scintillation was scarcely perceptible at the horizon, which seemed illumined by the great *nebulæ* of the southern

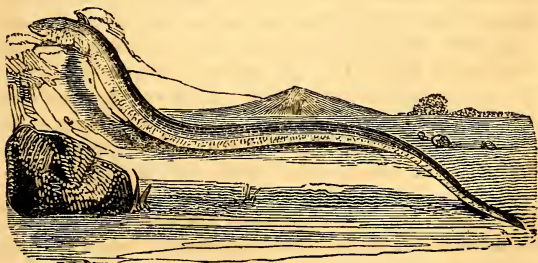
hemisphere. An innumerable multitude of insects spread a reddish light on the ground, which was loaded with plants, and glowed with these living and moving fires, as if the stars of the firmament had sunk down on the savannah. On quitting the cavern, we stopped several times to admire the beauty of this singular scene. The odoriferous vanilla, and festoons of bigonia, decorated the entrance; and above, on the summit of the hill, the arrowy branches of the palm-tree waved murmuring in the air."

Continuing their descent of the river, our travellers remained some days at the mission of Carichana, to recruit their exhausted strength. In two days more they reached Uruana, the situation of which is extremely picturesque. The village is placed at the foot of a lofty mountain, the granitic columns of which rear their heads above the tops of the tallest trees of the forest. The Orinoco assumes a most majestic aspect; it flows without a winding, like a vast canal, upwards of three miles in width. The Indians who inhabit this mission are the Otomacs, a rude tribe, whose habits display an extraordinary physiological phenomenon. "They eat earth; that is to say, during several months they every day swallow large quantities of it to appease their hunger, without injuring their health." It is during the season of the floods, when it becomes very difficult for them to procure fish—their ordinary food,—that they have recourse to this as a substitute. They are an extremely savage and vindictive race.

On the 7th of June, our travellers left Uruana, and spent the night at the island of Cucuruparu. In the neighbourhood of the almost deserted mission of San Miguel de la Tortuga are found, according to the In-

dians, otters with a very fine fur, and lizards with two feet. On the 8th they passed the mouth of the river Apure, which had formerly conducted them into the Orinoco, and on the 16th reached Angostura, the capital of Spanish Guiana. They were kindly received by the governor, and were delighted beyond measure when, for the first time, they saw wheaten bread on his table. "Coming from an almost desert country," says Humboldt, "we were struck with the bustle of a town, which has only six thousand inhabitants. Humble dwellings appeared to us magnificent, and every person with whom we conversed seemed to be endowed with superior intelligence."

At Angostura they were detained nearly a month, in consequence of illness; both of them, but Bonpland especially, suffering from violent fevers. On the 10th of July they quitted it, and after a fatiguing journey across the Llanos, reached the town of New Barcelona on the 23rd. Here Humboldt was again attacked by fever, and soon after his recovery both of the travellers set out on their return to Cumana, from which they had departed on their grand expedition nine months before.



Two-legged Lizard (*Lacula bipes*.)

CHAPTER XIX.

Adventure with the Privateer and the Hawk sloop of war—Captain Garnier—They arrive at Cumana—Optical phenomena—They arrive at Havannah—at Batabano—They leave Cuba—Arrive at the Rio Sinu—Maroon negroes—Carthagena—Turbaco—Air-volcanoes—They arrive at Santa Fe de Bogota—Cataract of Tequendama—Natural bridges of Icononzo—Pass of Quindiu—Cargueros—Cataracts of the Rio Vinaigre—Ridges of the Cordilleras—They arrive at Quito—Mountains of Cotopaxi and Chimborazo—They proceed towards Lima—Arrive at Loxa—Return to Peru—Sojourn at Lima—Set out for Guayaquil—Arrive at Acapulco.

THE travellers being anxious to reach Cumana, hired an open vessel, to go by sea from New Barcelona to that place. This vessel was employed in carrying on a contraband trade with the island of Trinidad. For this reason, the proprietor thought that they had nothing to fear from the enemy's vessels, which then blocked up all the Spanish ports; but they had scarcely reached the narrow channel between the continent and the little rocky isles, when, to their great surprise, they met an armed boat, which, hailing them at a great distance off, fired some musket-shots at them. This boat belonged to a privateer of Halifax; and, in spite of their passports and endeavours to give explanation, they were carried on board the privateer as a lawful prize. But while Humboldt was engaged with the captain in the cabin, in endeavouring to defend his own rights and those of the proprietor of the *lancha*, (open boat,) in which they had set out, a noise was heard upon deck, and something being whispered to the captain, he retired in consternation. The cause of this new behaviour in the captain was this:—An English sloop of war, the Hawk, cruising about in those parts, had come up, and made signals to the captain to bring to, which he not being prompt to obey, a gun



The Air-Volcanoes of Turbaco.



was fired from the sloop, and a midshipman sent on board, to demand the reason of the captain's negligence. Humboldt was very politely treated by the midshipman, and invited on board the Hawk, where he was received with the utmost kindness by Captain John Garnier, R.N., who told him that he had made the voyage to the north-west coast with Vancouver; and who appeared to be highly interested in all that was related to him, of the great cataracts of Atures and Maypures, and the communication of the Orinoco with the Amazon. Captain Garnier mentioned several of his officers who had been with Lord Macartney in China. Humboldt had not, he says, for a year, enjoyed the society of so many well-informed persons. They had learnt from the English newspapers the objects of his enterprise. He was treated with great confidence, and the commander gave him up his own state-room. They presented him, at parting, with the astronomical ephemerides for the years which he had not been able to procure in France or Spain. "I owe to Captain Garnier," writes Humboldt, with the delightful feelings of a grateful mind, "the observations I made on the satellites (of Jupiter) beyond the equator, and feel it a duty to record here the gratitude I feel for his kind offices. Coming from the forests of Cassiquiare, and having been confined during whole months to the narrow circle of missionary life, we felt a soothing gratification at meeting, for the first time, with men who had sailed round the world, and enlarged their ideas by the view of so varied a spectacle. I quitted the English vessel with impressions which are not yet effaced from my remembrance, and which led me to cherish still more the career I had chosen."

They arrived at length at Cumana, where their friends came out to meet them with great joy, as a report of their deaths on the banks of the Orinoco had been current for several months. While waiting here for the arrival of the Spanish packets, they employed themselves in further studying the plants of the country, in examining its geology, and in observations for determining certain latitudes and longitudes. Opportunities occurred during their stay at Cumana for sending off some of their most valuable collections to France.

After examining a mine of native alum, they set out again, in the middle of November, for New Barcelona, from whence they sailed on the 24th at nine o'clock in the evening, and next day at noon, reached the island of Tortuga, remarkable for its lowness and want of vegetation. On the 26th they observed a beautiful *parhelion*, or halo round the sun. Some indications of gloomy weather followed, and on the night of the 2nd of December a curious optical phenomenon was seen. The full moon being very high, there suddenly appeared on its side, about three quarters of an hour before its passage over the meridian, a great arc, which had the colours of the rainbow, but was of a gloomy aspect: It seemed higher than the moon, had a breadth of nearly 2° , and after remaining stationary for several minutes, it gradually descended and sank below the horizon. The sailors thought that it portended wind. On the next night there was seen, at the distance of a quarter of a mile, a small flame, which ran along on the surface of the sea towards the south-west, and illuminated the atmosphere. At length, they reached Havannah, after a rough passage of twenty-five days.

After examining the island of Cuba, and finishing the

observations which they had proposed to make, they set out on the 6th of March in the following year, for Batabano, where they arrived on the 8th. This is a poor village of Cuba, on the sea-coast, south of Havannah. It is surrounded by marshes, and covered with rushes and plants of the Iris family, among which appear here and there a few stunted palms. The marshes are infested with two species of crocodile, one of which has an elongated snout, and is very ferocious; the back is dark green, the belly white, and the flanks are covered with yellow spots.

They set sail again on the 9th, and proceeded through the Gulf of Batabano, Humboldt employing himself in examining the influence which the bottom of the sea produces on the temperature of its surface, and in determining the positions of some remarkable islands. They were two or three days on their passage through the Archipelago of the Jardines and Jardinillos, small islands and shoals partly covered with vegetation. They remained at anchor during the night, and by day visited those which were most easy of access. The sailors had been searching for *langoustes*, but not finding any, they avenged themselves on the young pelicans, perched on the trees. The old birds hovered round, uttering hoarse and plaintive cries, and the young defended themselves with vigour, although in vain. "On our arrival," says Humboldt, "a profound calm prevailed on this little spot of earth, but now everything seemed to say, 'Man has passed here.'"

On the morning of the 11th they visited the Cayo Flamenco, the centre of which is depressed, and only fifteen inches above the level of the sea. In the bay of Xagua, east of the Jardinillos, they were told that

fresh water gushed up in several places from the bottom of the sea, with such force as to prove dangerous for small canoes. Vessels sometimes take in fresh water from them, and fresh-water fish abound in the neighbourhood. The increased temperature in the seas, as they sailed on, indicated a great augmentation of depth.

After being agreeably entertained at the town of Trinidad, in Cuba, by the principal inhabitants of the place, as they returned to the Puerto Guaurabo, whence they were to set sail, they were very much struck by the prodigious number of phosphorescent insects which illuminated the grass and foliage. These insects are occasionally used for a lamp, being placed in a calabash perforated with holes; and a young woman at Trinidad informed them, that during a long passage from the mainland, she always had recourse to this light, when she gave her child the breast at night, the captain not allowing any other on board for fear of pirates.

The travellers, having embarked from the island of Cuba, were forced by stormy weather and contrary winds to seek shelter in the Rio Sinu, after a passage of sixteen days. The sailors, whom they met with at Zapote, and who were waiting for fair weather to convey their articles of commerce to Carthagena, tried to frighten the travellers with stories of boas, vipers, and jaguars. Here they entered a forest remarkable for palm-trees. The spathæ of one species, only six feet four inches high, they found to contain more than 200,000 flowers, a single specimen furnishing 600,000 at the same time. The kernels of the fruit are peeled in water, and the layer of oil that rises from them, after being purified by boiling, yields the *manteca de*

corozo, which is used for lighting churches and houses. Here, also, they found the inhabitants collecting palm-wine. The Rio Sinu, at the source of which grows the real febrifuge, *cinchona* (Peruvian bark), is a convenient means for *provisioning* the town of Carthagena.

After having been again for some time out at sea, Humboldt wished the captain to allow one of his sailors to land with him, in order that they might proceed on foot to the Boca Chica, which is the entrance to the port of Carthagena, and was only a few miles distant. This was refused by the captain, on account of the savage state of the country, in which there was neither path nor habitation; and an incident which occurred justified his prudence. The travellers were going on shore one fine moonlight night to collect plants. As they approached the land, they saw a young negro issue from the brush-wood, quite naked, loaded with chains, and armed with a cutlass. He engaged them to disembark on a particular part of the beach, where the sea did not break in, and offered to conduct them to the interior of the island of Baru, if they would give him some clothes. His cunning and savage air, the often-repeated question, whether they were Spaniards, the unintelligible words addressed to his companions concealed behind the trees,—all inspired them with mistrust. The blacks were probably *maroon* negroes, slaves escaped from the prison. This unfortunate class of persons was much to be dreaded; they had the courage of despair, and a desire of vengeance, nourished by the rigour of the whites. Humboldt and his companions were without arms; the negroes were numerous, and had perhaps engaged them to disembark, in order to take possession of the canoe. They prudently returned on board their vessel.

The sight of a naked man, wandering about on an uninhabited beach, without being able to unrivet the chains fastened round his neck and the upper part of his arm, left on our travellers the most painful impressions, which could only have been augmented by the ferocious regrets of the mariners, who wanted to return to the shore and seize the fugitives, to sell them secretly at Carthagera. "In climates," says Humboldt, "where slavery exists, the mind is familiarised with suffering, and that instinct of pity is stifled, which characterises and ennobles our nature."

During the week of their stay at Carthagera they had an opportunity of witnessing the pageant of the Pascua, or Easter-feast. Humboldt relates that nothing could rival the oddness of the dresses of the principal personages in these processions. Beggars, with crowns of thorns on their heads, and crucifixes in their hands, asked alms, habited in black robes. Pilate was arrayed in a garb of striped silk; and the apostles, seated round a large table covered with sweetmeats, were carried on the shoulders of Zambos. At sunset, effigies of Jews in French vestments, and formed of straw and other combustibles, were burnt in the principal streets.

The salubrity of Carthagera varies with the state of the marshes that surround it. The Cienega de Tesca, which is upwards of eighteen miles in length, communicates with the ocean; and when, in dry years, the salt water does not cover the whole plain, the exhalations that rise from it during the heat of the day become extremely pernicious. Dreading this, the travellers retired, on the 6th of April, to the Indian village of Turbaco, which is situated in a beautiful district at the entrance of a large forest, nearly twenty miles distant from Carthagera. The village is about 1151 feet above the level of the sea. Snakes were here found to be so

numerous, that they chased the rats even into the houses, and pursued the bats on the roofs.

But the most remarkable attraction of this place was a marshy ground situated in the midst of a thicket of palms, and which bore the name of *Los Volcancitos*. According to a tradition preserved in the village, the ground had formerly been ignited, and a monk had extinguished it with holy water, and converted the fire-volcano into a water-volcano. It was an open place of about 850 feet square, entirely destitute of vegetation, but margined with tufts of *Bromelia karatas*. The surface was composed of layers of clay, of a dark gray colour, cracked by dessication into pentagonal and hexagonal prisms. The volcancitos consist of fifteen or twenty small truncated cones, rising in the middle of this area, to the height of from nineteen to twenty-five feet. The most elevated were on the southern side, and their circumference at the base was from seventy-eight to eighty-five yards. On climbing to the top of these mud-volcanoes, they found them to be terminated by an aperture from sixteen to thirty inches in diameter, filled with water, through which air-bubbles obtained a passage, about five explosions taking place in two minutes. The force with which the air rises led to the supposition of its being subjected to considerable pressure; and a rather loud noise was heard at intervals, which preceded the disengagement of it. Each of the bubbles contained from twelve to fourteen and a half cubic inches of elastic fluid, and their power of expansion was often so great that the water was projected beyond the crater, or flowed over its brim. Some of the openings by which air escaped, were situated in the plain, without being surrounded by any prominence of the ground. It was observed that when the apertures, which are not

placed at the summit of the cones, and are enclosed by a little mud wall from ten to fifteen inches high, were nearly contiguous, the explosions did not take place at the same time. It would appear that each crater receives the gas by distinct canals, or that these, terminating in the same reservoir of compressed air, oppose greater or less impediments to the passage of the aëri-form fluids. The cones have no doubt been raised by these fluids, and the dull sound that precedes the disengagement of them, indicates that the ground is hollow. The natives asserted that there had been no observable change in the form and number of the cones for twenty years, and that the little cavities are filled with water even in the driest seasons. The temperature of this liquid was not higher than that of the atmosphere. A stick could easily be pushed into the apertures to the depth of six or seven feet, and the dark-coloured clay or mud was exceedingly soft. An ignited body was immediately extinguished, on being immersed in the gas collected from the bubbles, which was found to be pure azote, or nitrogen.

The stay which our travellers made at Turbaco was very agreeable, and added greatly to their collection of plants. "Even now," says Humboldt, writing in 1831, "after so long a lapse of time, and after returning from the banks of the Obi and the confines of Chinese Zungaria, these bamboo-thickets, that wild luxuriance of vegetation, those orchideæ covering the old trunks of the acotea and Indian fig, that majestic view of the snowy-mountains, that light mist filling the bottom of the valleys at sunrise, those tufts of gigantic trees rising like verdant islets from a sea of vapours, incessantly present themselves to my imagination. At Turbaco we lived a simple and laborious life. We were

young; possessed a similarity of taste and disposition; looked forward to the future with hope; were on the eve of a journey which was to lead us to the highest summits of the Andes, and bring us to volcanoes in action, in a country continually agitated by earthquakes; and we felt ourselves more happy than at any other period of our distant expedition. The years which have since passed, not all exempt from griefs and pains, have added to the charms of these impressions; and I love to think, that in the midst of his exile in the southern hemisphere, in the solitudes of Paraguay*, my unfortunate friend M. Bonpland, sometimes remembers with delight our botanical excursions at Turbaco, the little spring of Torecillo, the first sight of a *gustavia* in flower, or of the *cavanillesia*, loaded with fruits having membranous and transparent edges."

In the course of two months, the travellers had passed up the river from Carthagená to Santa Fe de Bogotá, the capital of New Grenada. This city stands in a beautiful plain, surrounded by lofty mountains; and this plain would appear to have been formerly the bed of a great lake. It is 8727 feet above the level of the sea, and is consequently, higher than the summit of St. Bernard, in Switzerland. Here the travellers spent several months in exploring the mineralogical and botanical treasures of the country, together with the magnificent cataract of Tequendama. "The traveller who views the tremendous scenery of the cataract of Tequendama, will not be surprised that rude tribes should have assigned a miraculous origin to rocks which seem to have been cut by the hand of man; to that narrow gulf into which falls, headlong, the mass of waters that issue

* This alludes to the detention of M. Bonpland in Paraguay by the dictator, Dr. Francia.

from the valley of Bogota; to those rainbows, reflecting the most vivid colours, and of which the forms vary every instant; to that column of vapour, rising like a thick cloud, and seen at the distance of five leagues from the walks around Santa Fe."

In remote times, according to the tradition which is current among the people, the inhabitants of Bogota were barbarians, living without religion, laws, or arts. An old man on a certain occasion suddenly appeared among them, of a race unlike that of the natives, and having a long bushy beard. He instructed them in the arts; but he brought with him a very malignant, although very beautiful woman, who thwarted all his benevolent enterprises. By her magical power she swelled the current of the Funza, and inundated the valley, so that most of the inhabitants perished, a few only having found refuge in the neighbouring mountains. The aged visitor then drove his consort from the earth, and she became the moon. He next broke the rocks that enclosed the valley on the Tequendama side, and by these means drained off the waters; then he introduced the worship of the sun, appointed two chiefs, and finally withdrew to a valley, where he lived in the exercise of the most austere penitence during 2000 years.

This fall and its scenery present a remarkable combination of attractions. Humboldt observes that the impression which cataracts leave on the mind of an observer, depend on the concurrence of a variety of circumstances. The volume of water must be proportioned to the height of the fall, and the scenery around must wear a wild and romantic aspect. The Pissevache and the Staubbach, in Switzerland, are lofty, the latter, indeed, exceeding 800 feet in height;



Cataract of Tequendama.



but their masses of water are inconsiderable. The falls of the St. Lawrence at Niagara, and those of the Rhine at Schaffhausen, furnish enormous volumes of water; but even the former does not exceed 160 feet in height, while the latter scarcely reaches 60 feet. The height of the fall of Tequendama (which forms a double bound), is 574 feet!

Cataracts which are surrounded by hills only, produce far less effect than the falls of water which rush into the deep and narrow valleys of the Alps, of the Pyrenees, and above all, of the Cordilleras of the Andes. Independent of the height and mass of the column of water, the figure of the landscape, and the aspect of the rocks, it is the luxuriant form of the trees and herbaceous plants, their distribution into groups, or into scattered thickets, the contrast of those craggy precipices, and the freshness of vegetation, which stamp a peculiar character on these great scenes of nature. The fall of Niagara, placed beneath a northern sky, in the region of pines and oaks, would be still more beautiful, were its drapery composed of heliconias, palms, and arborescent ferns. The cataract of Tequendama forms an assemblage of everything which is sublimely picturesque in fine scenery.

Leaving Sante Fe in September, 1801, the attention of the travellers was next arrested by the natural bridges of Icononzo, and from their reports of these specimens of natural architecture we extract the following details.

The valley of Icononzo, or Pandi, is one of the most remarkable in the Andes, not so much for its dimensions, as for the singular form of its rocks, which appear as if they had been cut by the hand of man. Their

naked and barren tops present the most picturesque contrast with the tufts of trees and shrubs, which cover the edges of its curious crevice. Through this valley a small torrent, called the Rio de la Summa Paz, has forced a passage; it descends from the easternmost of the three chains into which the Andes are here divided, or that chain which separates the great plains of the Orinoco from the basin of the river Magdalena, and it flows towards the latter. The bed in which this torrent is confined is almost inaccessible; and it could not have been crossed without great difficulty, if Nature had not provided two bridges of rock, which are justly considered, in the country, as among the objects most worthy of the attention of travellers. The name, "Icononzo," is that of an Indian village, which stood at the southern extremity of the valley, and of which a few scattered huts are now the only remains.

It is at about the middle of the valley that the torrent rushes through the deep crevice over which the bridges extend; and the stream here forms two fine water-falls; one on entering the crevice, and the other on escaping from it. At the height of nearly 320 feet, the uppermost bridge crosses the chasm; its length is about 48 feet, and its breadth 40. The rock of which the bridge is formed is very compact; it preserves its natural position, lying in beds nearly horizontal.

Sixty feet lower than this bridge, and very near to it, is the second, crossing the same chasm. Unlike the first, however, it is not one fragment of unbroken and undisturbed strata, but it is composed of three enormous masses of rock, which have accidentally fallen down and met in their descent, so as to support each other, and form an arch, of which the middle mass is



Icononzo.

the key-stone. In the middle of this second bridge is a large hole about eight yards square, through which the traveller looks down into the abyss beneath, and discerns the torrent flowing, as it were, through a dark cavern, while his ear is assailed by the ceaseless and melancholy noise of the countless troops of nocturnal birds, which haunt the chasm. Thousands of these birds were seen flying over the surface of the water. Humboldt at first mistook them for the gigantic bats, so well known in the equatorial regions. It is impossible to catch them, on account of the depth of the crevice; and the only mode of examining them is by throwing down rockets to light up the sides of the chasm. Their plumage is of an uniform brownish grey: according to the Indians, who call them *cacas*, they are of the size of a common fowl, and have a curved beak, with the eye of an owl. Humboldt supposed them to belong to the *Caprimulgidæ*, or goat-suckers.

The next description which arrests our attention, is that which refers to the mountain of Quindiu, and from Humboldt's narrative of it we furnish the subsequent interesting particulars.

The pass of Quindiu is considered to be the most difficult in the Andes. The mountain presents a thick uninhabited forest, to traverse which, in the finest season, requires from ten to twelve days: not a hut is to be seen, nor are any means of subsistence to be found. It is the custom for travellers to take with them a month's provision, when they attempt the passage; as it often happens, that by the melting of the snow, and the sudden swelling of the streams, they are in a manner insulated and prevented for a time from descending in any direction. The highest point of the pass is almost 11,500 feet above the level of the sea. The pathway

is very narrow, varying indeed from only a foot to sixteen inches in breadth; in some places it is sunk so deep, as to present the appearance of a gallery dug in the ground and left open above*. The rock is in general covered with a thick layer of clay, in which the torrents have hollowed out gulleys eighteen or twenty feet deep; along these muddy channels the traveller is often obliged to grope his way, for more than a mile at a time. Occasionally he meets a string of oxen, the usual beasts of burden, with difficulty forcing a passage; and then he is reduced to the uncomfortable necessity of lifting himself up in the best way he can, by the aid of roots, &c., and letting them pass under him. As these animals are accustomed to tread in the same tracks, they form small furrows across the road separated by narrow ridges; in very rainy seasons these ridges are hidden by water, and the unfortunate foot-traveller missing them, often steps into the furrows.

Such then was the route by which Humboldt, and his equally adventurous companion Bonpland, crossed the mountain of Quindiu on foot in the month of October, 1801, followed by a train of twelve oxen, carrying their collections and instruments. During the last three or four days while descending the western declivity, they were exposed to a deluge of rain. "The road," says Humboldt, "passes through a country full of bogs, and covered with bamboos. Our shoes were so torn by the prickles which shoot out from these gigantic gramina, that we were forced to go barefooted. This circumstance, the continual humidity, the length of the

* The summit of the pass of the great St. Bernard in the Pennine Alps is more than 8200 feet above the level of the sea; that of the Simplon is 6578 feet; and that of the Cervin, the loftiest pass in Europe, is 11,096 feet. The pass of Quindiu is not the highest in the Andes; nor is its elevation so great as that of some of the inhabited table-lands.

passage, the muscular force required to tread in a thick and muddy clay, the necessity of fording deep torrents of icy water, render this journey extremely fatiguing. It is not, however, accompanied by the dangers with which the credulity of the people alarms travellers. The road is narrow, but the places where it skirts precipices are very rare."

Many persons however, being unable or unwilling to encounter the fatigue of this journey on foot, and the road being utterly impracticable for mules, recourse has been had to a singular mode of conveyance, —namely, in chairs tied to men's backs. The occupation of these porters, or *cargueros*, as they were called, formed a regular trade in the Cordilleras; and people there talked of going on a man's back, as naturally as we talk of going on horseback. The travellers in their route sometimes met a file of fifty or sixty of these men-carriers.



Cargueros.

In the foreground is a band of cargueros coming up the mountain; there is represented the mode of fastening on the shoulders the chair made of bamboo-wood, which is steadied by a head-stall similar to that worn by horses and oxen. The roll in the hand of the third carguero is the roof, or rather moveable house, which is generally used to shelter travellers who cross the forests of Quindiu. It is customary on reaching Hague, where they prepare for the journey, to pluck in the adjoining mountains several hundred leaves of the vijao, a plant of the banana family. These leaves are about twenty inches in length, and fourteen inches in breadth; they are membranous and silky, and their lower surface is covered with a peculiar substance,—a sort of varnish, which enables them to resist the rain for a long time. In gathering them an incision is made in the middle rib, which is the continuation of the footstalk; and by this they are suspended when the roof is formed. When it is taken down, the leaves are spread out and carefully rolled up in a cylindrical bundle. About a hundred-weight of leaves will cover a hut large enough for six or eight persons.

“When the travellers,” says Humboldt, “reach a spot in the midst of the forests where the ground is dry, and where they propose to pass the night, the cargueros lop a few branches from the trees, with which they make a tent. In a few minutes, this slight timber-work is divided into squares by the stalks of some climbing plant, or threads of the agava, placed in parallel lines, twelve or fifteen inches from each other. The vijao leaves, having been unrolled, are now spread over this framework, so as to cover each other in the same manner as the tiles of a house. These huts, thus hastily built, are cool and commodious. If, during his stay, the



Falls of the Vinaigre River.

traveller feels the rain, he points out the spot where it enters, and a single leaf is sufficient to obviate the inconvenience. We passed several days in the valley of Boquia under one of these leafy tents, which remained perfectly dry amidst violent and incessant rains."

"The Andes," says Humboldt, "bear the same proportion to the chain of the Alps, as these to the chain of the Pyrenees. Whatever I have beheld, picturesque or awful, on the borders of the Saverne, in the north of Germany, or the Euganean mountains, the central chain of Europe, or the rapid declivity of the peak of Teneriffe, I have found all assembled in the Cordilleras of the New World. It would require ages to observe these beauties, and discover the wonders which nature has lavished over an extent of 2500 leagues, from the granite mountains of the Strait of Magellan to the coasts bordering on the east of Asia."

From these mountains, where the truncated cone of Tolima, covered with perennial snow, rises to the height of 17,190 feet, amidst forests of styrax, arborescent passifloræ, bamboos, and wax-palms, they descended into the valley of Cauca towards the west. After resting some time at Cathago and Buda, they coasted the province of Choco, where platina is found among rolled fragments of basalt, greenstone, and fossil wood. They then went up by Caloto and the mines of Quilichao towards Popayan, which is situated at the base of the snowy mountains of Purace and Sotara, the former of which is volcanic. The Indian hamlet of Purace, which was visited by the travellers in November, 1801, is celebrated for the fine cataracts of the Rio Vinaigre, the waters of which are acid. This little river is warm towards its source, and after forming three falls, one of which is 394 feet in height, and is

exceedingly picturesque, joins the Rio Cauca, which for fourteen miles below the junction is destitute of fish. The crater of the volcano, is filled with boiling water, which, amid frightful noises, emits vapours of sulphuretted hydrogen.

“On advancing from Popayan towards the South, we see on the arid elevated plain of the province of *Los Pastos*, the three small chains of the Andes lost in one group which stretches far beyond the equator. This group, in the kingdom of Quito, presents an extraordinary appearance from the river of Chota, which meanders amid mountains of basaltic rock to the Parimé of Assuay, on which are seen some remarkable remains of Peruvian architecture. The most elevated summits are arranged in two lines, which form, as it were, a double ridge to the Cordilleras. These colossal summits covered with perpetual ice, served for signals in the operations of the French academicians, at the time of the measurement of the equinoctial degree. Their symmetrical dispositions in two lines, directed from north to south, has led Bouguer to consider them as two chains of mountains, separated by a longitudinal valley: but what this celebrated astronomer calls ‘the bottom of a valley,’ is the summit of the Andes itself; it is an elevated plain, the absolute height of which is from 8800 to 9000 feet.

“In these plains the population of this marvellous country is concentrated; towns are there built, which contain from thirty to fifty thousand inhabitants. When we have lived for some months on this elevated spot, where the barometer keeps at an height 21·3 inches, we feel the irresistible influence of an extraordinary illusion; we forget by degrees that everything which surrounds the observer,—those villages

which proclaim the industry of a mountain-population, those pastures covered at the same time with herds of llamas and flocks of European sheep—those orchards bounded by hedges of *duranta* and *bardanesia*—those fields cultivated with care and promising the richest harvests,—hang as it were suspended in the lofty regions of the atmosphere; we scarcely recollect that the soil is more elevated above the neighbouring coasts of the Pacific Ocean than the summit of Canigou above the basin of the Mediterranean.

“By considering the ridge of the Cordilleras as a vast plain, curtained by distant mountains, we accustom ourselves to look upon the inequalities of the crest of the Andes as so many isolated summits. Pichincha, Cayambo, Cotopaxi, though to more than half their height they form but one mass, appear to the eyes of the inhabitant of Quito as so many distinct mountains, towering in a plain unclothed with forests. This illusion is so much the more complete, as the breaches in the double ridge of the Cordilleras reach down to the level of the high inhabited plains. Hence, it is only when seen at a distance from the coasts of the Great Ocean, or from the savannahs which extend to the foot of the eastern declivity, that the Andes present the appearance of a single chain.”

In going from the city of Quito to the Parimé of Assuay, as many as ten or twelve of these summits are seen rising on either side of the central elevated plain, to a height greater than that of Mont Blanc, in a distance of thirty-seven leagues; they exhibit their forms in strong relief against the azure sky, and appear “like a bold rocky coast which, rising from the bosom of the waters, seems the less distant, inasmuch as no object is placed between the shore and the eye of the

observer. But the enormous elevation of the plain, from which these summits rise, greatly diminishes the impression of their height; so that to the eye of a spectator on the plain they do not seem so lofty as others which are actually less elevated above the level of the sea, but which are viewed from a lower point."

If these summits of the Andes were "placed on islets scattered along the immensity of the ocean," they would astonish the spectator much more by their stupendous elevations. "Mountains," observes Humboldt, "which would astonish us by their height if they placed near the sea-shore, seem to be but hills when they rise from the ridge of the Cordilleras;" and he mentions a remarkable illustration afforded near Quito, by a small conical summit called "Javirac," which does not seem higher to the inhabitants of that city than Montmartre, or the heights of Meudon, appear to the people of Paris; which, however, he found by admeasurement to be upwards of 10,300 feet above the level of the sea.

After a journey of four months, performed on mules, Humboldt and the other travellers arrived at Quito, on the 6th January, 1802. Here they devoted nearly six months to researches of various kinds, and particularly to excursions to the snowy mountains, of which Cotopaxi and Chimborazo are the principal. Cotopaxi is the loftiest of those volcanoes of the Andes which have produced eruptions at recent periods; its height being 18,878 feet. The scorïæ and rocks ejected by it, and scattered over the neighbouring valleys, would form a vast mountain of themselves. In 1738 its flames rose 2953 feet above the crater; and in 1744 its roarings were heard as far as Honda, on the Magdalena, 690 miles

off. On the 4th of April, 1768, the quantity of ashes thrown out was so great, that in the towns of Ham-bato and Tacunga the inhabitants were obliged to use lanterns in the streets. The explosion which took place in January, 1803, was preceded by the sudden melting of the snows which covered the surface; and our travellers, at the port of Guayaquil, 179½ miles distant, heard day and night the noises proceeding from it, like discharges of a battery.



Cotopaxi.

This celebrated mountain, which has destroyed many cities, and sometimes ejects warm water and half-boiled fish, is situated south-east of Quito at the distance of 41 miles, in the midst of the Andes. Its form is the most beautiful and regular of all the colossal summits of that mighty chain; being a perfect cone, which is covered with snow, and shines with dazzling splendour at sunset. No rocks project through the icy covering, except near the edge of the crater, which is surrounded by a small circular wall. In ascending, it is extremely difficult to reach the lower boundary of the snows,

the cone being surrounded by deep ravines; and after a near examination of the summit, Humboldt thinks he may assert that it would be altogether impossible to reach the brink of the crater.

Travellers who have approached the summits of Mont Blanc and Mont Rosa, are alone capable of feeling the character of the calm, majestic, and solemn scenery of these mountains of the Andes. The bulk of Chimborazo is so enormous, that the part which the eye embraces at once, near the limit of the eternal snows, is about 23,000 feet in breadth. The extreme rarity of the strata of air across which we see the tops of the Andes, contributes greatly to the splendour of the snow and the magical effect of its reflection. Under the tropics, at a height of about 17,000 feet, the azure vault of the sky appears of an indigo tint. The outlines of the mountain detach themselves from the sky in this pure and transparent atmosphere, while the inferior strata of the air, reposing on a plain destitute of vegetation, which reflects the radiant heat, are vaporous, and appear to veil the middle ground of the landscape.

The sides of the mountain present that gradation of vegetable life, which may be followed on the western top of the Andes, from the impenetrable groves of palm-trees to the perpetual snows bordered by thin layers of lichens. At the height of 11,500 feet, the ligneous plants with coriaceous and shining leaves nearly disappear. The region of shrubs is separated from that of the grasses by alpine plants, by tufts of nerteria, valerian, saxifrage, and lobelia, and by small cruciferous plants. The grasses form a very broad belt, covered at intervals with snow, which remains but a few days. This belt, called in the country the *pajonal*, appears at a distance like a gilded yellow

carpet. Its colour forms an agreeable contrast with that of the scattered masses of snow; and is owing to the stalks and leaves of the grasses burnt by the rays of the sun in the seasons of great drought. Above the *pajonal* lies the region of cryptogamous plants, which here and there cover the porphyritic rocks destitute of vegetable earth. Further on, at the limit of the perpetual ice, is the termination of organic life.

On a narrow ledge of Chimborazo, which rises amidst the snows on the southern declivity, our travellers attempted on the 23rd of June to reach the summit. The point where they stopped to observe the inclination of the magnetic meridian was more elevated than any yet attained by man, being 3609 feet higher than the summit of Mont Blanc. The ridge to which they climbed, and beyond which they were prevented from proceeding by a deep chasm in the snow, was 19,798 feet above the level of the sea; but the summit was still 1439 feet higher. The blood issued from their eyes, lips, and gums, at this elevation.

The climate of the province of Quito is remarkably agreeable, and almost invariable. During the months of December, January, February, and March, it generally rains every afternoon from half-past one till five: but even at this season the evenings and mornings are most beautiful. The temperature is so mild, that vegetation never ceases. At the town of Quito the first European corn was sown near the convent of St. Francis by Father Jose Rixi, a native of Flanders; and the monks still show, as a precious relic, the earthen vessel in which the original wheat came from Europe. "Why," asks our author, "have not men preserved everywhere the names of those who, in place of ravaging the earth, have enriched it with plants useful to the human race?"

After thus spending their time in exploring the Andes, and examining everything else worthy of their research, the travellers set out in the direction of Lima. They first pointed their course to the great river Amazon, and visited the ruins of Lactacunga, Hambato, and Riobamba, in a country, the face of which was entirely changed by the frightful earthquakes of 1797, that destroyed nearly 40,000 of the inhabitants. They then with much difficulty passed to Loxa, where, in the forests of Gonzanama and Malacates, they examined the trees which yield the Peruvian bark. They next



Peruvian Bark.

proceeded to inspect the magnificent remains of the causeway of the Incas, which traversed the porphyritic summits of the Andes from Cuzco to Assuay, at a height varying from 7670 to 11,510 feet. At the village of Chamaya, on a river of the same name, they took ship and descended to the Amazon. With the view of completing the map of this country, made by the French astronomer, La Condamine, they proceeded as far as the cataracts of Rentama; Bonpland employing himself, as usual, in examining the subjects of the vegetable kingdom, among which he discovered several new species of *Cinchona**.

Returning to Peru, they crossed the Cordillera of the Andes for the fifth time. They then proceeded to examine the mines of Hualgayoc, where large masses of native silver are found, at an elevation of 11,613 feet above the sea, and which, together with those of Pasco and Huantajayo, are the richest in Peru. From Caxamarca, celebrated for its hot springs and the ruins of the palace of Atahualpa, they went down to Truxillo. In this neighbourhood are the remains of the ancient Peruvian city Mansiche, adorned with pyramids, in one of which an immense quantity of gold was discovered in the eighteenth century. Descending the western slope of the Andes they beheld for the first time the Pacific Ocean, and the long narrow valley bounded by its shores, in which rain and thunder are unknown. From Truxillo they followed the arid coast of the South Sea, and at length arrived at Lima, where they remained several months.

In January, 1803, Humboldt and his friends embarked for Guayaquil, in the vicinity of which they

* This is the generic term for two species of Peruvian trees, which yield the famous "Jesuits' bark."

found a splendid forest of palms, plumeriæ, tabernæ montanæ, and scitamineæ. Here also, as we noticed before, they heard the incessant noise of the volcano of Cotopaxi, which had experienced a tremendous agitation on the 6th of January. From Guayaquil they proceeded by sea to Acapulco in New Spain

CHAPTER XX.

The travellers visit the most remarkable places of Mexico—Cascade of Regla—Volcano of Jorullo—They return to Mexico—Great Pyramid of Cholula—Perote—Small-pox—Canal of Mexico—Condition of Agriculture—The Mines—they visit the United States—they return to Europe—Fate of Bonpland—of Humboldt—Visit of the latter to Asia—Conclusion.

ACAPULCO, whither our travellers had now arrived, is a sea-port town on the western side of Mexico or New Spain. It was the original intention of Humboldt to remain only a few months in Mexico, and return as speedily as possible to Europe; more especially as his instruments, and in particular the chronometers, were getting out of order, while he found it impossible to procure others. But the attractions of so beautiful and diversified a country, the great hospitality of its inhabitants, and the dread of the yellow fever of Vera Cruz, which usually attacks those who descend from the mountains between June and October, induced him to remain until the middle of winter.

After making many of their usual observations and experiments on the atmospherical phenomena, the hourly variations of the barometer, magnetism, and the natural productions of the country, they set out in the direction of Mexico; gradually ascending by the burning valleys of Mescala and Papagayo, where the thermo-

meter rose to almost 90° in the shade, and where the river is crossed on fruits of *Crescentia pinnata*, attached to each other by ropes of agave. Reaching the elevated plains of Chilpantzuigo, Tehuilotepic, and Tasco, situated at an average height of 5000 feet above the level of the sea, they entered a region blessed with a temperate climate, and producing oaks, cypresses, pines, tree-ferns, and the cultivated corn-plants of Europe. After visiting the silver-mines of Tasco, the oldest and formerly the richest of Mexico, they went up by Cuernaraca and Guachilaco to the capital. Here they spent some time in the agreeable occupation of examining numerous curiosities, antiquities, and institutions, in making astronomical observations, in studying the natural productions of the surrounding country, and in enjoying the society of enlightened individuals. The longitude of Mexico, which had been misplaced two degrees on the latest maps, was accurately determined by a long series of observations.

They next visited the celebrated mines of Moran and Real del Monte, and examined the obsidians of Oyamel, which form layers in pearlstone and porphyry, and were used by the ancient Mexicans for the manufacture of knives. The cascade of Regla is situated in this neighbourhood. The regularity of its basaltic columns is as remarkable as that of the deposits of Staffa. Most of them are perpendicular, though some are horizontal, and others have various degrees of inclination. They rest upon a bed of clay, beneath which basalt again occurs. On this subject Humboldt has the following remarkable observations:—

“In changing our latitude and climate we see a change in the aspect of organic nature, in the form of animals and of plants, which impresses a peculiar cha-

racter on every zone. With the exception of some aquatic and cryptogamous vegetables, the soil in every region is covered with different plants. It is not so with inanimate nature, with that aggregation of earthy substances, which covers the surface of our planet; the same decomposed granite, on which, amid the frosts of Lapland, the vacciniums, the andromedas, and the moss that nourishes the rein-deer, vegetate, is found again in those bowers of fern-trees, of palms, and of heliconia, the shining foliage of which unfolds itself under the influence of the equatorial heats. When at the end of a long voyage, after passing from one hemisphere to another, the inhabitant of the north lands on some distant shore, he is surprised to find, amid a crowd of unknown productions, those strata of slate, micaceous schist, and trappean porphyry, that form the arid coasts of the old continent, bathed by the icy ocean. Under every climate the rocky crust of the globe presents the same appearance to the traveller; he everywhere finds, and not without emotion in the midst of a new world, the rocks of his native country."

Returning from this excursion in July 1803, they next made another to the northern part of the kingdom, in the course of which they inspected the aperture made in the mountain of Suicog for the purpose of draining the valley of Mexico. They next passed by Queretaro, Salamanca, and the fertile plains of Yrapuato, on their way to Guanaxuato, a large city placed in a narrow defile, and celebrated for its mines. Here they remained two months, making researches into the geology and botany of the neighbouring country. Thence they proceeded by the valley of San Jago to Valladolid, the capital of the ancient kingdom of Mechoacan; and notwithstanding a continuance of heavy autumnal rains,

descended by Patzquaro, which is situated on the edge of an extensive lake towards the shores of the Pacific Ocean, to the plains of Jorullo. Here they entered the great crater, making their way over crevices, which exhaled ignited sulphuretted hydrogen, and experiencing much danger from the brittleness of the lava.

The formation of this volcano is one of the most extraordinary phenomena which have been observed on our globe. The plain of Malpais, covered with small cones, from six to ten feet in height, is part of an elevated table-land, bounded by hills of basalt, trachyte, and volcanic tuff. From the period of the discovery of America to the middle of the last century, this district had undergone no change of surface, and the seat of the crater was then covered with a plantation of indigo and sugar-cane; when, in June 1759, hollow sounds were heard, and a succession of earthquakes continued for two months, to the great consternation of the inhabitants. From the beginning of September everything seemed to announce the re-establishment of tranquillity; but in the night of the 28th the frightful subterranean noises again commenced. The Indians fled to the neighbouring mountains. A tract three to four square miles in extent rose up in the shape of a dome; and those who witnessed the phenomenon asserted, that flames were seen issuing from a space of more than six square miles, while fragments of burning rocks were projected to an immense height, and the surface of the ground undulated like an agitated sea. Two brooks which watered the plantations precipitated themselves into the burning chasms. Thousands of the small cones described above, suddenly appeared, and in the midst of these eminences, called *hornitos*, or ovens, six great masses, having an elevation

of from 1312 to 1640 feet above the original level of the plain, sprang up from a gulf running from N.N.E. to S.S.W. The most elevated of these mounds is the great volcano of Jorullo, which is continually burning. The eruptions of this central volcano continued till February 1760, when they became less frequent. The Indians, who had abandoned all the villages within thirty miles of it, returned once more to their cottages, and advanced towards the mountains of Aguasarco and Santa Ines, to contemplate the streams of fire that issued from the numberless apertures. The roofs of the houses of Queretaro, more than 166 miles distant, were covered with volcanic dust.

When Humboldt visited this place, he was assured by the natives that the heat of the hornitos had formerly been much greater. The thermometer rose to 203° when placed in the fissures, which exhaled aqueous vapour. Each one of the cones emitted a thick smoke, and in many of them a subterranean noise was heard, which seemed to indicate the proximity of a fluid in ebullition. Two streams were at that period seen bursting through the argillaceous vaults, and were found by the travellers to have a temperature of 127° . The Indians give them the names of the two rivers which had been engulfed; because in several parts of the Malpais great masses of water are heard flowing in a direction from east to west. Humboldt himself considers all the district to be hollow.

The Indians of this province are represented as the most industrious of New Spain. They had a considerable talent for cutting out images in wood, and dressing them in clothes made of the pith of an aquatic plant, which being very porous imbibes the most vivid colours. Two figures of this kind which Hum-

Humboldt presented to the Queen of Prussia, exhibit the characteristic traits of the American race, together with a strange mixture of the ancient costume with that which was introduced by the Spaniards.

The travellers returned to Mexico by the elevated plain of Toluca, after examining the volcanic mountains in its vicinity. They also visited the celebrated cheiranthostæmon of Cervantes, a tree of which it was at one time supposed there did not exist more than a single specimen. They remained here for several months, for the purpose of arranging their botanical and geological collections, calculating the barometrical and trigonometrical measurements they had made, and sketching the plates of the geological atlas which Humboldt proposed to publish. They also assisted in placing a colossal equestrian statue of the king, which had been cast by a native artist. In January, 1804, they left Mexico in order to examine the eastern declivity of the Cordillera of New Spain. They likewise measured the great pyramid of Cholula, an extraordinary monument of the Toltecks, from the summit of which there is a splendid view of the snowy mountains and beautiful plains of Tlascala. It is built of brick, dried in the sun, alternating with layers of clay. They then descended to Xalapa, a city placed at an elevation of 4335 feet above the sea, in a delightful climate. The dangerous road which leads from it to Perote, through almost impenetrable forests, was thrice barometrically levelled by Humboldt. Near the latter place is a mountain of basaltic porphyry, remarkable for the singular form of a small rock placed on its summit, and which is named the "Coffer of Perote." This elevation commands a very extensive prospect over the plain of Puebla, and the eastern slope of the Cor-

dilleras of Mexico, which is covered with dense forests. From it they also saw the harbour of Vera Cruz, the Castle of St. Juan of Ulloa, and the sea-coast.

Humboldt has published a topographical and physical description of Mexico, by means of which, and the visits of subsequent travellers, this part of the globe no longer remains among the least known of those remote countries over which the power of Europe has extended. Before Humboldt's visit, the maps of the country were so inaccurate, that the longitude and latitude of the capital were uncertain. On the 21st of February, 1803, the inhabitants of Mexico were alarmed by a total eclipse of the sun, which eclipse was set down in the almanacs of the place as being scarcely visible. We cannot follow the disquisitions of the learned traveller on the condition of New Spain, because the limits of this little work would not allow us to furnish more than a meagre and uninteresting outline; and because, likewise, though the physical relations of New Spain stand nearly as they did when Humboldt visited it, such a treatise would better become a regular and methodical history of the country of Mexico. We shall content ourselves, therefore, with referring to two or three curious facts.

One of the causes which, amongst others, tends to retard the increase of numbers in Mexico, is the small-pox. It seems to exert its power at periods of seventeen or eighteen years. It has been less destructive of late years, chiefly in consequence of the zeal with which inoculation was propagated. The vaccine method was introduced in various parts of Mexico and South America at the commencement of the present century. Humboldt mentions a curious circumstance, tending to show that the discovery of our celebrated countryman, Dr.

Jenner, had long been known to the country-people among the Andes of Peru. A negro slave, who had been inoculated for the small-pox, shewed no symptom of the disease, and when the practitioners were about to repeat the operation, he told them he was certain that he should never take it, for when milking cows in the mountains, he had been affected with cutaneous eruptions, caused, as the herdsman said, by the contact of pustules sometimes found on the udders.

It is a great disadvantage to Mexico that it stands nearly on a level with the surrounding lake; which, in seasons of heavy rains, overwhelms it with destructive inundations. The construction of a *desague*, or canal, to carry off the waters of the Lake of Zumpango, and of the principal river by which it is fed, has since 1629, prevented any very desolating flood. The *desague*, though not conducted with skill and judgment, cost 1,040,000*l.*, and is one of the most stupendous hydraulic works ever executed. Were it filled with water, the largest vessels of war might pass by it through the range of mountains which bound the plain of Mexico. The alarms, however, have been frequent, and cannot well cease while the level of that lake is 20 feet above that of the great square of Mexico.

The appearance of the country of Mexico shows that the inhabitants are nourished by the soil, and that they are independent of foreign commerce. Yet agriculture is by no means so flourishing as might be expected from its natural resources, although considerable improvement has taken place of late years. The low state of cultivation has been generally attributed to the existence of rich mines; but Humboldt, on the contrary, maintains that the working of these ores has been beneficial, in causing many places to be improved which

would otherwise have remained barren. When a vein is opened on the sterile ridge of the Cordilleras, the new colonists can only draw the means of subsistence from a great distance. Want soon excites to industry, and farms begin to be established in the neighbourhood. The high price of provisions requites the cultivator for the hard life to which he is exposed, and the ravines and valleys become gradually covered with food. When the mine fails, and the workmen retire, the population diminishes, but the settlers usually stay in the spot where they have passed their childhood. The Indians, too, prefer living in the solitudes of the mountains, remote from the whites, and this circumstance tends to increase the number of inhabitants in such districts.

The plant called the *maguey*, (agave Americana,) is extensively reared for the purpose of converting its juice into a spirituous liquor called *pulque*. The finest plantations of it seen by the travellers were in the valley of Toluca and on the plains of Cholula. This latter place is celebrated for the old pyramids, which remain as memorials of ancient Mexican grandeur.

When the travellers left the city of Mexico, they went down to the port of Vera Cruz, which is situated among sand-hills, in a burning and unhealthy climate. They happily escaped the yellow fever, which most usually attacks people who come down from the mountains, and those who arrive by sea; and having embarked in a Spanish frigate for Havannah, where they had left part of their specimens, they sojourned there two months. After this, they set sail for the United States, and arrived at Philadelphia; they afterwards visited Washington, and spent eight weeks in that interesting country, for the purpose of studying its political constitution and commercial relations. In August, 1804, they returned to Europe.



Pulque plant.



Cholula.

The extensive collections which they had made during their perilous and fatiguing journeys, and the general results of their expedition, have been of the highest importance to policy, historical knowledge, and science. Natural history, botany, astronomy, and geography, have been aided and advanced with reference to the American part of the torrid zone.

We are told that, when these philosophic travellers had returned from America, Bonpland was appointed by Buonaparte to the office of superintending the gardens of Malmaison, where the Empress Josephine, who was passionately fond of flowers, had formed a splendid collection of exotics. The amenity of his disposition, as well as his acquirements, procured for him the esteem of all who knew him. In 1818 he went to Buenos Ayres as Professor of Natural History. In 1820 he undertook an expedition into the interior of Paraguay; but, when he had arrived at St. Anne, on the eastern bank of the Parana, where he had established a colony of Indians and a tea-plantation, he was suddenly surrounded by a troop of soldiers, who destroyed the plantation, and carried him off a prisoner. This was done by order of Dr. Francia, governor of Paraguay; and the only reason given was, his having planted the tea-tree peculiar to that country, and which forms a valuable article of exportation. He was confined chiefly in Santa Martha, but was allowed to practise as a physician. Humboldt, who makes pathetic mention of him, as we narrated at page 243, applied in vain for the liberation of his friend, who did not until very lately obtain his liberty.

In October, 1818, Humboldt was in London where it was said that the Allied Powers had requested him to draw up a political view of the South American

colonies. About the same time the king of Prussia granted him a pension of 12,000 dollars, in order to facilitate the execution of a plan which he had formed of visiting Asia, and especially the mountains of Thibet. In the year 1822, he accompanied his Majesty to the Congress of Verona, and afterwards visited Venice, Rome, and Naples; and in 1827 and 1828, he delivered, at Berlin, a course of lectures on the physical constitution of the globe, which was attended by the royal family and the Court. In the year 1829 he undertook another important journey to the Uralian mountains, the frontiers of China, and the Caspian Sea. We refrain from offering the reader any epitome of this expedition because the limits of this work warn us to come to a conclusion, and because the expedition just referred to, is better fitted for the attention of the votary of science, than for the lover of general literature.

THE END.

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